Explanatory Note

The expressions 'lakh' and 'crore' signify 100,000 and 10,000,000 respectively.

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THIRD FIVE YEAR PLAN

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POLICY AND ORGANISATION

PROGRAMMES OF DEVELOPMENT

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INTRODUCTION

THIS REPORT sets out the objectives, policies and programmes of development for the Third Five Year Plan.

Two Five Year Plans have helped strengthen the foundations of economic and social life and stimulated industrial and economic growth and scientific and technological advance.

The Third Five Year Plan seeks to give a more precise content to the social objectives of the Constitution and represents a large advance towards their realisation. It takes account of the successes and the failures in the first two Plans and sets the tasks to be fulfilled in the perspective of development over the next fifteen years and more.

Work on the preparation of the Third Plan commenced towards the end of 1958 and was carried out in three main stages. The first, leading to the publication of the Draft Outline early in July, 1960, comprised detailed studies by working groups set up at the Centre and in the States. Parliament gave its general approval to the Draft Outline in August, 1960.

The Draft Outline was discussed throughout the country and served as the basis for the preparation of the plans of States. These were considered with the Chief Ministers of States between September and November, 1960. In January, 1961, the National Development Council made its recommendations concerning the overall size and the structure of the Third Plan; the Council also set up a Committee on Savings to suggest ways of securing the maximum mobilisation of resources for the Third Plan. Finally, on May 31 and June 1, 1961, the National Development Council considered the Draft Report on the Third Plan and generally approved it.

The objectives and priorities of the Third Plan were considered carefully by five Parliamentary Committees in November, 1960, and every effort has been made in this Report to avail of the suggestions and comments offered by these Committees. Several aspects of the Plan were placed from time to time before the Committee of Members of Parliament from different political parties presided over by the Prime Minister. The Consultative Committee of Members of Parliament associated with the Planning Commission also reviewed the Plan at various stages.

Throughout the preparation of the Plan, leading public men and scholars, professional associations, organisations representing industry and labour, and independent experts generously gave of their time and experience. The Planning Commission had the benefit of advice and

suggestions from its Panel of Economists, Panel of Scientists, and Panels on Land Reform, Agriculture, Education, Health and Housing. It was also helped by studies initiated by the Programme Evaluation Organisation, the Research Programmes Committee, the Committee on Plan Projects, the Central Statistical Organisation, the Indian Statistical Institute and other leading organisations engaged in research. Efforts to prepare plans at the district, block and village level, specially for the development of agriculture, cooperation, education and rural industries, were an integral part of the process of drawing up the plans of States as well as the National Plan. These local plans are a vital element in the success of Panchayati Raj, which places in the hands of the people of each area the initiative and responsibility for their own development and the means and resources for rapid advance.

The preparation of the Third Plan has been, thus, a vast national undertaking in which valuable contributions have come from many sources, and at every stage there has been the closest collaboration with the State Governments and the Central Ministries.

The Third Plan represents the first phase in a scheme of long-term development extending over the next fifteen years or so, the preparation of which will now be taken in hand. In the course of this period, India's economy must not only expand rapidly but must, at the same time, become self-reliant and self-generating. This long-term approach is intended to provide a general design of development for the country's natural resources, agricultural and industrial advance, changes in the social structure and an integrated scheme of regional and national development.

The Plan sets large objectives and targets for the five-year period. They are large only in comparison with the past, not in relation to needs or to the nation's capacity to achieve. They constitute a minimum which must be assured, but their true purpose is to open the way to a still more intensive endeavour and a deeper sense of urgency.

The size of the task and the many-sided challenge should not be under-estimated. The greatest stress in the Plan has to be on implementation, on speed and thoroughness in seeking practical results, and on creating conditions for the maximum production and employment and the development of human resources. Discipline and national unity are the very basis of social and economic progress and the achievement of socialism. At each step, the Third Plan will demand dedicated leadership at all levels, the highest standards of devotion and efficiency from the public services, widespread understanding and participation by the people, and willingness on their part to take their full share of responsibility and to bear larger burdens for the future.

CHAPTER I

OBJECTIVES OF PLANNED DEVELOPMENT

I

INTRODUCTION

THE basic objective of India's development must necessarily be to provide the masses of the Indian people the opportunity to lead a good life. That indeed is the objective of all countries for their peoples, even though the good life may be defined in many ways. In the larger context of the world, the realisation of this objective for India, as for other countries, is intimately tied up with, and dependent on the maintenance of world peace. War, with the weapons of modern warfare, would not only be an end to all hopes of progress but would endanger the survival of the human race. Peace, therefore, becomes of paramount importance and an essential pre-requisite for national progress. The existence of underdeveloped and poverty-stricken nations or peoples is itself an abiding danger to the maintenance of peace. It has, thus, been increasingly recognised that the welfare and peace of the world require the extermination of poverty and disease and ignorance from every country, so as to build up a liberated humanity.

2. Each major culture and civilisation has certain distinctive features, rooted in the past, which bear the impress of that culture. India, with thousands of years of history, bears even now the powerful impress of her own distinctive features. They are today covered up by widespread and appalling poverty, the result of a traditional society and a static economy in the past, petrified to some extent by colonial rule. But these essential features, though apparently associated with the traditional structure of society are in no sense an integral part of it. They are in fact a set of moral and ethical values which have governed Indian life for ages past, even though people may not have lived upto them. These values are a part of India's thinking, even as, more and more, that thinking is directed to the impact of the scientific and technological civilisation of the modern world. To some extent, the problem of India is how to bring about a synthesis between these two. Probably, no other country in the modern world would have produced a Gandhi; even Tagore, who was typically modern in his approach to life's problems, was, at the same time, steeped in India's old culture and thinking. His message is thus one of synthesis between these two.

3. To provide the good life to the four hundred million people of India and more is a vast undertaking, and the achievement of this goal is far off. But no lesser goal can be kept in view, because each present step has

to be conditioned by the final objective. Behind the plans that are drawn up is the vision of the future, even as the Indian people had a vision of freedom and independence during the long years of their national struggle, and there is faith and confidence in that future. Fully conscious of existing difficulties the people have also the conviction that these difficulties will be overcome. The experience of the last ten years of planning and the large social and economic changes that have already taken place have brought a conviction that India can look forward with assurance to sustained economic progress. Even in this ancient land, for so long governed by tradition, the winds of change are blowing and affecting not only the dweller in the city but also the peasant in his field. At each stage, new conflicts and new challenges arise. They have to be met with courage and confidence. There is an excitement in this changing face of India as the drama of India's development plans unfolds itself.

4. The more immediate problem is to combat the curse of poverty, with all the ills that it produces, and it is recognised that this can only be done by social and economic advance, so as to build up a technologically mature society and a social order which offers equal opportunities to all citizens. This involves basic social and economic changes and the replacing of the old traditional order by a dynamic society. It involves not only the acceptance of the temper and application of science and modern technology, but also far-reaching changes in social customs and institutions. To some extent, recognition of this twofold aspect of change has been present in the Indian mind for generations past. Gradually it has taken more concrete shape and has become the basis for planning.

5. It was inevitable that during India's struggle for freedom, the political aspect of Independence overshadowed everything else. Yet, from its earliest beginnings, Indian nationalism had a large element of economic thinking and social reform. This was, to some extent, an unusual feature for a national movement. Freedom was considered the indispensable means to overcome mass poverty, to protect the farmer and the artisan, to create modern industry, to remove privilege and injustice and to reconstruct the entire fabric of India's social and economic life. Beginning with Dadabhai Naoroji, whose paper on 'The Poverty of India' was presented as far back as 1876, a long line of national leaders placed these aims in the forefront of the national struggle. As the national movement grew and spread among the people of India, its social content became deeper. With the coming of Mahatma Gandhi, the movement spread with remarkable rapidity to the peasantry and the workers of India. To Gandhiji freedom was not merely a political objective, but the raising of the masses of the people from their poverty and degradation. He aligned himself with the

masses of the Indian people and more especially with those who were in the lowest rungs of the social ladder. Under his leadership the national movement came to identify itself more and more with the service of the masses and, progressively, a very large proportion of its membership came from amongst the peasants. The agrarian problem thus came to occupy a prominent place in its thinking even as, under Gandhiji's guidance, it made the uplift of the depressed and the underprivileged one of its major planks.

6. In this way, as the political struggle for Independence developed and took shape in mighty movements, it was allied in some measure to India's basic social and economic problems, and more particularly the agrarian problem. The social and economic aims of the struggle for freedom became progressively more definite. A comprehensive economic programme was adopted in 1931, and an agrarian programme in 1936. Towards the end of 1938, a National Planning Committee was constituted and, thus, the idea of planning came into prominence in India. The National Planning Committee could not carry on its work effectively because of the beginning of the Second World War, in the course of which many of its members found themselves in prison. But it considered nearly all aspects of planning and ultimately produced a series of studies containing social and economic policies and programmes, which formed the basis of a more organised attempt at planning after Independence.

7. The Second World War resulted, by the compulsion of events, in the growth of some industries in India. Even before Independence was established, the Interim Government gave thought to planning and constituted an Advisory Planning Board to collect all the available material for it. Owing to the disastrous consequences of Partition and the vast numbers of people who were uprooted and driven out from Pakistan to India and India to Pakistan, there was some delay in giving effect to the recommendations of the Board. Early in 1950, following the adoption of the new Constitution by the Constituent Assembly of India, the Government of India established the Planning Commission to assess the country's material, capital and human resources and to formulate a Plan for their most effective and balanced utilisation.

8. In the Constitution the basic objectives were set forth as "The Directive Principles of State Policy". Among those 'Directive Principles' were that

> "The State shall strive to promote the welfare of the people by securing and protecting, as effectively as it may, a social order in which justice, social, economic and political, shall inform all the institutions of national life".

Further that—

"The State shall, in particular, direct its policy towards securing—

(a) that the citizens, men and women equally, have the right to an adequate means of livelihood;

(b) that the ownership and control of the material resources of the community are so distributed as best to subserve the common good;

(c) that the operation of the economic system does not result in the concentration of wealth and means of production to the common detriment."

These general principles were given a more precise direction in December, 1954, when Parliament adopted the 'socialist pattern of society' as the objective of social and economic policy. This concept, which embodies the values of socialism and democracy and the approach of planned development, involved no sudden change, and had its roots deep in India's struggle for freedom.

9. Thus, ever since Independence, two main aims have guided India's planned development—to build up by democratic means a rapidly expanding and technologically progressive economy and a social order based on justice and offering equal opportunity to every citizen. To change a traditional society into a dynamic one, in a country with a vast population rooted in the past, was a tremendous task. To do this through peaceful and democratic means and by the consent of the people, made this task even more difficult. It was inevitable that India should accept peaceful and democratic means as these had been the very methods it had adopted in its struggle for freedom.

10. With these objectives in view, the First Five Year Plan faced this task with limited means and inadequate data. The immediate objectives it laid down were achieved and this success gave confidence to the nation. The Second Five Year Plan, being based on somewhat greater experience and more knowledge, set forth larger goals and a long-term strategy for economic and industrial advance based on the socialist pattern of society. In describing the approach to planned development, the Second Five Year Plan stated:

"....The task before an underdeveloped country is not merely to get better results within the existing framework of economic and social institutions, but to mould and refashion these so that they contribute effectively to the realisation of wider and deeper social values.

"These values or basic objectives have recently been summed up in the phrase 'socialist pattern of society'. Essentially, this

means that the basic criterion for determining lines of advance must not be private profit, but social gain, and that the pattern of development and the structure of socio-economic relations should be so planned that they result not only in appreciable increases in national income and employment but also in greater equality in incomes and wealth. Major decisions regarding production, distribution, consumption and investment—and in fact all significant socio-economic relationships—must be made by agencies informed by social purpose. The benefits of economic development must accrue more and more to the relatively less privileged classes of society, and there should be progressive reduction of the concentration of incomes, wealth and economic power. The problem is to create a milieu in which the small man who has so far had little opportunity of perceiving and participating in the immense possibilities of growth *through organised effort is enabled to put in his best* in the interests of a higher standard of life for himself and increased prosperity for the country. In the process, he rises in economic and social status. Vertical mobility of labour is thus no less important than horizontal mobility, for nothing is more destructive of hope and more inhibitive of effort than a feeling that the accident of birth or of a poor start in life is likely to come in the way of a capable person rising in life in terms of economic and social status...

"The socialist pattern of society is not to be regarded as some fixed or rigid pattern. It is not rooted in any doctrine or dogma. Each country has to develop according to its own genius and traditions. Economic and social policy has to be shaped from time to time in the light of historical circumstances. It is neither necessary nor desirable that the economy should become a monolithic type of organisation offering little play for experimentation either as to forms or as to modes of functioning. Nor should expansion of the public sector mean centralisation of decision-making and of exercise of authority. In fact, the aim should be to secure an appropriate devolution of functions and to ensure to public enterprises the fullest freedom to operate within a framework of broad directives or rules of the game........

"....The accent of the socialist pattern of society *is on the attainment* of positive goals, the raising of living standards, the enlargement of opportunities for all, *the promotion of enterprise* among the disadvantaged classes and the creation of a

sense of partnership among all sections of the community. These positive goals provide the criteria for basic decisions. The directive principles of State policy in the Constitution have indicated the approach in broad terms; the socialist pattern of society is a more concretised expression of this approach. Economic policy and institutional changes have to be planned in a manner that would secure economic advance along democratic and egalitarian lines. Democracy, it has been said, is a way of life rather than a particular set of institutional arrangements. The same could well be said of the socialist pattern."

II

PLANNED DEVELOPMENT

11. When Independence came, India had a slender industrial base. Millions of her rural people suffered under the weight of a traditional agrarian structure. A long period of economic stagnation, against the background of increasing pressure of population, followed by the burdens of the Second World War, had weakened the Indian economy. There was widespread poverty and want. The partition of the country had uprooted millions of people and dislocated economic life. Productivity in agriculture and industry stood at a low level. In relation to needs the available domestic savings were altogether meagre. The promise of freedom could only be redeemed if the economic foundations were greatly strengthened. The Constitution established equal rights of citizenship, and these had now to be expressed through rising levels of living and greater opportunities for the bulk of the people. It was essential to rebuild the rural economy, to lay the foundation of industrial and scientific progress, and to expand education and other social services. These called for planning on a national scale, encompassing all aspects of economic and social life, for efforts to mobilise resources, to determine priorities and goals and to create a widespread outlook of change and technological progress. Thus, planned development was the means for securing with the utmost speed possible, a high rate of growth, reconstructing the institutions of economic and social life and harnessing the energies of the people to the tasks of national development.

12. The leading features of the pattern of development envisaged in the Five Year Plans may be briefly stated. The basic objective is to provide sound foundations for sustained economic growth, for increasing opportunities for gainful employment and improving living standards and working conditions for the masses. In the scheme of development, the first priority necessarily belongs to agriculture; and agricultural pro-

duction has to be increased to the highest levels feasible. The Five Year Plans provide for a comprehensive and many-sided effort to transform the peasant's outlook and environment. The growth of agriculture and the development of human resources alike hinge upon the advance made by industry. Not only does industry provide the new tools, but it begins to change the mental outlook of the peasant. There can be no doubt that vast numbers of the peasantry today in India are undergoing this change of outlook as they use new tools and experiment with new methods of agriculture. Even the coming of the bicycle in large numbers to the villages of India is not only a sign of higher standards, but is a symbol of new and changing attitudes. Agriculture and industry must be regarded as integral parts of the same process of development. Through planned development, therefore, the growth of industry has to be speeded and economic progress accelerated. In particular, heavy industries and machine-making industries have to be developed, the public sector expanded and a large and growing cooperative sector built up. The public sector is expected to provide specially for the further development of industries of basic and strategic importance or in the nature of public utility services, other industries being also taken up by Government to the extent necessary. State trading has also to be undertaken on an increasing scale according to the needs of the economy. In brief, in the scheme of development, while making full use of all available agencies, the public sector is expected to grow both absolutely and in comparison and at a faster rate than the private sector.

13. With the rapid expansion of the economy, wider opportunities of growth arise for both the public and the private sectors and in many ways their activities are complementary. The private sector includes not only organised industry but agriculture, small industry, trade and a great deal of activity in housing and construction and other fields. Progressively, it has to take the form of cooperative effort. Among the main objects of programmes undertaken by the Government are the expansion of facilities for the development of agriculture, specially irrigation, the building up of economic overheads such as rail and road transport, ports and power stations, and the expansion of education, health and other social services. Activities which are promoted through these facilities are in considerable part in the hands of private individuals and organisations, and increasing numbers among them are being assisted. Thus, the Five Year Plans enlarge the scope for individual initiative as well as for co-operative and corporate effort. It is mainly within a limited area in the field of large-scale industrial enterprise that the question arises whether, in the special circumstances of the country, in accordance with the Industrial Policy Resolution of April, 1956, and in view of the social goals aimed at, particular tasks should be assigned to the public sector or to the private sector. In the context of the country's planned development the private sector has a large area in which to develop and expand. It has to

function, of course, within the framework of national planning and in harmony with its overall aims, and there must be continuous stress on undertakings in the private sector acting with an understanding of obligations towards the community as a whole. At the same time, it is essential to ensure that the opportunities available in the private sector do not lead to the concentration of economic power in the hands of small numbers of individuals and businesses and that disparities in income and wealth are progressively reduced.

14. In the pattern of development envisaged in the Five Year Plans, cooperation is expected to become progressively the principal basis of organisation in several branches of economic life, notably, in agriculture, small industry, distribution, construction and provision of essential amenities for local communities. Village and small scale industries have a crucial role in the development of the national economy, for, besides providing consumer and other goods and large-scale employment, they offer a method of ensuring a more equitable distribution of the national income and the means for the utilisation of available resources in skill and manpower. Disparities in levels of development in different regions have to be steadily reduced and the benefits of industrialisation spread evenly between different parts of the country. These aims have to be achieved, as the Industrial Policy Resolution specified, through the balanced and coordinated development of the industrial and agricultural economy of each region, and through planned urbanisation and the development of economic and social services. Frequently, in the early phases of development, there is a dilemma to be faced: whether it is better to concentrate on developing more favourably situated areas and thus securing quicker and larger returns from the investment, or to aim at more even development of the country, through greater attention to the more backward areas. Economic considerations have necessarily to be given importance, but certain social and regional aspects cannot be ignored. Indeed, as the economy develops, it becomes possible to provide for more intensive development in the less developed areas.

15. The policies described above constitute the larger part of the programme for achieving rapid economic development and for realising the socialist pattern of society. In such a scheme the basic criterion in determining social policies and the lines of economic advance must necessarily be the interest of the community as a whole, and especially of its weaker sections. Through its very success and dynamism, a rapidly developing economy throws up new problems of organisation and management as well as of social policy. The existing social and economic institutions have, therefore, to be appraised from time to time in relation to their role in the nation's development. To the extent they do not adequately fulfil the social purpose or fail to secure the economic aims of planned development, they have to be replaced or transformed.

16. Development plans reflect the changes which are taking place in the country's economic and social structure as well as the directions in which this structure has to be reorganised and strengthened. In a democracy the pace of change depends to a large extent on increase in public understanding and in public response and on the growth of a scientific outlook on the part of large numbers of people. Besides the economic and social objectives, the educational aspects of planning are, therefore, of great importance. These are emphasised through the wide sharing of responsibility for drawing up and carrying out Plans and through the participation in the process of planning by organisations representing all sections of opinion as well as universities and educational institutions and voluntary social service agencies. On behalf of the community as a whole the State has a large responsibility for assessing the wider long-term needs of the nation as against the claims of individual, sectional or regional interests, and in setting the goals to be achieved.

III

Progress Towards Socialism

17. It is a basic premise in India's Five Year Plans that, through democracy and widespread public participation, development along socialist lines will secure rapid economic growth and expansion of employment, reduction of disparities in income and wealth, prevention of concentration of economic power, and creation of the values and attitudes of a free and equal society. These are vital objectives. Where the bulk of the people live so close to the margin of poverty, the claims of social justice, of the right to work, of equal opportunity and of a minimum level of living have great urgency. Economic activity must, therefore, be so organised that the tests of production and growth and those of equitable distribution are equally met. A high rate of economic growth sustained over a long period is the essential condition for achieving a rising level of living for all citizens, and especially for those in low income groups or lacking the opportunity to work. Increase in population and the need for investment in basic productive capacities and in economic and social overheads, which yield their benefits after a considerable period, place large burdens on a developing economy. On the one hand, they limit the extent to which, over the short period, living standards can be raised; on the other, to be borne at all, their burdens must be shared widely, calling for sacrifice, according to capacity, by every section of the community.

18. Progress towards socialism lies along a number of directions, each enhancing the value of the others. Above all, a socialist economy must be efficient, progressive in its approach to science and technology, and capable of growing steadily to a level at which the well-being of the

mass of the population can be secured. In an underdeveloped country, a high rate of economic progress and the development of a large public sector and a cooperative sector are among the principal means for affecting the transition towards socialism. In the second place, a socialist economy should ensure equality of opportunity to every citizen. As a first step, it should provide for the basic necessities, in particular, for food, work, opportunity for education, reasonable conditions of health and sanitation, improvement in conditions of housing and a minimum level of income which, in the given circumstances, will ensure tolerable living standards. In the third place, through the public policies it pursues, a socialist economy must not only reduce economic and social disparities which already exist, but must also ensure that rapid expansion of the economy is achieved without concentration of economic power and growth of monopoly. Finally, a society developing on the basis of democracy and socialism is bound to place the greatest stress on social values and incentives and on developing a sense of common interest and obligations among all sections of the community. On account of the rigidities of the caste system as well as economic differences, India's social structure already presented numerous inherent conflicts and barriers to economic advance. While some of the old distinctions are passing—a process which is being speeded up—urbanisation and the growth of modern industry tend to introduce new disparities in levels of income and opportunity. In turn, these are reflected in modes of living, social behaviour and a general increase in the spirit of acquisitiveness. It is the aim of public policy to check undesirable tendencies and to ensure that these do not come in the way of building up a society which is fundamentally integrated from within and derives its strength from common values and a sense of shared citizenship.

IV

EQUAL OPPORTUNITIES

19. The first condition for securing equality of opportunity and achieving a national minimum is assurance of gainful employment for every one who seeks work. In an underdeveloped country, failure to provide full employment can be traced to certain fundamental deficiencies in the economic structure. Until the industrial base has been greatly strengthened and education and other social services developed, the economy is unable to achieve a rate of growth sufficient to provide work at an adequate level of remuneration to the entire labour force. These processes of development necessarily take time and call for a scale of effort and investment which may be well beyond the capacity of the economy in the early stages. Poverty is most acute in areas which have heavy pressure of population or in which, on account of the scanty

development of local resources, low levels of productivity persist and there is lack of continuous work. There must, therefore, be additional opportunities for work to enable the lowest income groups to earn enough through productive employment to meet their minimum needs. In the Third Plan, it is envisaged that, along with programmes of development for large and small industries, for agriculture and for economic and social services, there will also be a large-scale programme for rural works especially in densely populated regions and for periods of under-employment during the slack agricultural seasons.

20. In advanced countries the development of education and other social services has played a large part in ensuring greater equality of opportunity to different sections of the population and greater social mobility. Social services have also helped to bring about a measure of redistribution of income and provide the basic necessities. In India too, the expansion of social services will exert a similar influence, specially through the extension of free and universal education at the primary level, provision of larger opportunities for vocational and higher education, grants of scholarships and other forms of aid, and improvement in conditions of health, sanitation, water supply and housing. Thus, programmes for the welfare of scheduled tribes and castes and other backward classes, for the provision of minimum amenities in rural areas, for local development at the village level and for the housing of industrial workers and slum clearance and improvement, are to be viewed not merely as extensions of social services but as vital ingredients in the scheme of economic development. These and other social benefits have to be provided to a greater extent in the Third and subsequent Five Year Plans than has been possible over the past decade. They will call for larger resources, not only from the State, but also from within each community, and for the participation of a growing number of voluntary workers.

21. As economic development proceeds, social security and insurance will come to have high priority. Through the scheme of provident funds and health insurance for industrial workers the first important steps in this direction have already been taken. In the course of the Third Plan, it is proposed to introduce a scheme of employment assistance for industrial workers and to make a small start with relief and assistance for destitute persons, orphans and physically handicapped persons without means of support or livelihood. In areas in which the rural works programme is taken in hand, facilities for registration are to be provided for persons seeking work. Thus, social services along with intensive economic development, the provision of scholarships and other facilities in the field of training and education and the beginnings of social security should go some distance in providing more equal opportunities to different sections of the community.

22. Increase in agricultural production, the growth of modern industry and of transport and power, and the development of the public and the cooperative sectors in the economy will create conditions which will make it possible to advance towards socialism and to improve living standards. These will gain greater social significance in the measure in which socialism develops at the level of the community and enlists widespread local effort. As the values of socialism and democracy become more pervasive, influencing everyday attitudes and behaviour, wider opportunities will open up for all sections in the community, and especially for the under-privileged.

23. A large segment of India's development plans reaches the mass of the people through community development. In promoting the growth of socialism at the level of the community amongst the rural people, therefore, the role assigned in the Five Year Plans to the community development movement should be specially stressed. Community development must seek, above all, to bring about increase in agricultural production, higher standards of productivity, and fuller utilisation of the available manpower and other resources. With its stress on the development of local initiative and responsibility and on cooperative self-help, the movement is designed to serve as a spearhead of a wide range of programmes of development, which include agriculture, cooperation, irrigation, village and small industries, rural electrification and the reform of the agrarian system. One of its major aims is to create conditions for the growth of a progressive cooperative rural economy with a diversified occupational structure in which the weaker sections of the community are brought speedily to the level of the rest. The development of a cooperative agro-industrial economy in rural areas is essential for ensuring that the benefits of industrialisation spread out evenly among different sections of the population and to different areas and for securing a large measure of integration between rural and industrial development in each region.

24. A recent development of the community development movement in the rural areas has been, what is called, Panchayati Raj, or democratic decentralisation. At the village, block and district levels, responsibility for development is entrusted to Village Panchayats, Panchayat Samitis and Zila Parishads, and they are given considerable powers. This is a revolutionary change in the structure of administration within the district and in the pattern of rural development, and is already producing significant results and changing the rural climate.

25. In the villages the task of building up socialism at the base is facilitated as the policies of land reform and cooperative development are implemented and as the approach of bhoodan and gramdan and of common obligations begins to permeate within each rural community. In

the towns and cities also there is equal need for appropriate social policies. The influx of population into urban areas leads not only to a worsening of living conditions for large sections of the population but also, through rise in the values of land and property, to the creation of new disparties. These developments demand a variety of measures, including careful planning of the use of land, large scale programmes for land acquisition, housing and land allotment policies designed to assist the lower income groups and the poorer sections of the population, adequate taxation of capital gains and urban properties, avoidance of conspicuous and wasteful forms of construction, and public vigilance over conditions of tenancy and rents.

V

Distribution of Economic Power

26. The growth of the corporate private sector over the past decade has brought to the fore the question of the means by which economic growth will be secured without concentration of economic power and the emergence of monopolistic tendencies. As a rule, the process of rapid economic development tends to enlarge opportunities for well-established firms to expand their size and enter new fields of enterprise. As compared to new undertakings or to smaller enterprises, they enjoy advantages in organisation and expertise, in access to the capital market and ability to secure foreign collaboration and, generally, in the resources which they are in a position to deploy. The fact that a significant proportion of the resources available for investment in industry arises within the corporate sector itself is another factor which makes it easier for an existing unit to expand than for a new one to come into being and take firm root. In several industries technological considerations favour the setting up of large-scale units with resultant savings in capital cost and in the cost of production. Consequently, certain difficult problems arise. On the one hand, to the extent to which large existing enterprises undertake development in accordance with the priorities set in the Five Year Plans and avail of essential economies of scale, they assist the growth of the economy. On the other, excessive economic power in relatively few hands and the uses to which it may be put, disturb the balance of power in a democracy, expose the social structure to new strains and tensions, and come in the way of diffusion of economic opportunities.

The tendency towards concentration of economic power has to be countered in a variety of ways—firstly, through the extension of the public sector into fields requiring the establishment of large scale units and heavy investments; secondly, through widening opportunities for new entrants and for medium and small-sized units as well as for industries organised on cooperative lines; and, thirdly, through effective exercise of

Government's powers of control and regulation and use of appropriate fiscal measures. The object, briefly, must be not merely to prevent concentration of economic power and the growth of monopolistic tendencies, but also to promote a pattern of industrial organisation which will lead to high levels of productivity and give full scope, *within the framework* of national planning, to new entrepreneurs, to medium and small-scale enterprises and to cooperative organisations.

27. As a decisive instrument which the State can employ in preventing concentration of economic power and growth of monopolistic tendencies, the rapid expansion of the public sector serves a twofold purpose. It helps to remove certain basic deficiencies in the economic structure and, at the same time, it reduces the scope for accumulation of wealth and large incomes in private hands. In the generation and distribution of electric power, the public sector has now the principal share and is being rapidly enlarged. Its share in transport has also steadily increased. In large industries and minerals the total investment in the public sector during the Third Plan will be distinctly higher than that in the private sector. As compared to 1950-51, by the end of the Third Plan, the contribution of the public sector will increase from less than 2 per cent to nearly a fourth in organised manufacturing industries and from less than a tenth to over a third in mineral production. While these are significant developments, careful attention must be given to factors which will increase the capacity of the public sector to expand still more rapidly, such as efficiency of operation, availability of trained managerial and technical personnel in larger numbers and ability to earn large surpluses. It is also essential that to the greatest extent feasible construction and supply functions for State undertakings should be entrusted to public and cooperative agencies. As the relative share of the public sector increases, its rôle in economic growth will become even more strategic and the State will be in a still stronger position to determine the character and functioning of the economy as a whole.

28. Within the field of activity entrusted to the private sector, the major aim of policy is to ensure broad-based ownership in industry, diffusion of enterprise and liberal facilities for new entrants, and the growth of cooperative organisations. Means for achieving these objectives are already available to a large extent, but need to be employed by the Central and State Governments and the various agencies functioning under them more purposefully and with greater coordination than in recent years. In licensing new industrial units and sanctioning the expansion of existing units, there must be considerable vigilance in permitting the growth of large existing businesses and, in the greatest measure possible, the entry of new firms should be facilitated and small and medium enterprises and cooperative organisations encouraged. In

recent years a number of financial and promotional institutions have been established, such as the Industrial Finance Corporation, the State Finance Corporations, the Industrial Credit and Investment Corporation of India and others. In the light of the experience gained during the Second Plan, these and other financial institutions should review their existing administrative policies and practices so as to ensure that their support to new entrants into industry and to medium and small enterprises as well as to cooperative undertakings is both speedy and adequate. They should also devise suitable criteria for assessing progress in these directions. The State Bank of India as well as other commercial banks may be expected to play an increasing part in financing medium-sized, small and cooperative industries. The resources of the Life Insurance Corporation could also be of material assistance in the furtherance of these objectives. The Investment Centre recently established can assist in securing foreign exchange facilities for new enterprises. Finally, a brief reference may be made to the role of industrial estates and programmes for the development of village and small industries, rural electrification, regional planning and location of new townships which are described in later Chapters. These development programmes are among the most important positive steps under the Five Year Plans for taking the benefits of industrialisation to the smaller towns and villages.

29. In a developing economy taxation is one of the main instruments of social policy and, in accordance with the needs of the Plan, devices such as rebates, concessions and incentives have to be employed so as to prevent concentration of economic interests and to encourage new units as well as medium and small-scale businesses and cooperative undertakings. The provisions needed are already available within the existing framework of personal and corporate taxation, wealth tax, gift tax, capital gains tax and estate duty, and should be employed in an integrated manner. Problems relating to tax evasion and tax avoidance and suitable measures for dealing with them are being given careful consideration. With the passing of the Companies Act, 1956, and the amendments recently undertaken, developments in company management such as inter-corporate investment, interlocking directorships, use of internal resources and the remuneration of directors and other top management personnel can be watched more closely and steps taken to ensure that the legislative provisions concerning them are administered effectively. Powers under the Industries Development and Regulation Act can also be used to exercise control over production, distribution and prices to the extent necessary. To sum up, in dealing with the problems of concentration of economic power, there is already general agreement on the broad objectives, and the necessary legislative and other sanctions needed are in fact available for the greater part. It is, therefore, specially important in the present context

that the content of measures and of the administrative methods and practices adopted in pursuance of them should in practice subserve the wider social purpose, and the existing arrangements should be re-examined in relation to the tasks and priorities of the Third Five Year Plan.

VI

Disparities in Income

30. Before the process of economic development gathers momentum, for the larger part inequalities arise from long-established features of a traditional society, such as feudal rights and tenures, or privileges and handicaps associated with the social structure. These vestiges of the past are the first to fall. Planned development has to hasten this process so as to enable the economy to move forward with less hindrance from within. Thus, the programme of land reform, with its stress on the abolition of intermediary rights, security and rent reduction for tenants and enforcement of ceilings on agricultural holdings, was calculated to release the productive forces of the rural economy. There has been progress in this direction but, owing to inadequate implementation of tenancy reforms and delays in carrying out the programme for ceilings on agricultural holdings, this has been less than was hoped for. Greater efforts are, however, now being made to give effect to legislation enacted in the States.

31. Disparities in income and wealth which arise from industrial and economic growth raise a series of complex problems. The first of these concerns differences in levels of earned income. In advanced countries these have now been greatly reduced. On the other hand, in underdeveloped countries, unless special measures are taken in the first phases of economic development, there is a tendency for them to become even larger than before. This is due to a variety of circumstances, more especially the relative scarcity of trained personnel, lack of social mobility, and the presence of inflationary influences. The essential problem here is to reduce the spread between the higher and the lower incomes and to raise the level of the minimum. This calls, among others, for large scale programmes of training and for steps to ensure that in all branches of the economy, both in the public and in the private sector, there is rapid growth of opportunities for merit. Tax policies have an important role and should be used to bring the net earnings of those in high income brackets to reasonable levels. This is a question at present, not so much of attempting to set rigid ceilings, as of giving a general direction to public policy and to public thinking. In this connection it will be recalled that the Taxation Enquiry Commission considered a reasonable range of incomes after tax to be about

thirty times the average family income. This broad objective should be progressively realised over the next two or three Plan periods. Although, in view of the low incomes of the bulk of the population, this range represents a considerable disparity, it could be further reduced as lower incomes rise.

32. An important aspect of the problem of income disparities concerns the gap between rural and non-rural incomes which tends to widen under the impact of industrial and economic development. Increase in agricultural productivity, reduction in the dependence on land and diversification of the economic structure of rural areas through the extension of industry and the development of social services on an adequate scale, and an agricultural price policy which is both fair to the urban consumer and fully safeguards the farmer's interest, are the principal means by which the gap between rural and urban incomes can be kept within narrow limits. In a country with a large rural population, these policies have great significance.

33. In a growing economy, frequently high incomes are due in the main to the accrual of capital gains, to trading and speculative profits, and to perquisites of one kind or another which are permitted by law. A twofold approach is therefore called for. Firstly, through social policy, incomes arising from capital gains, speculation, etc. must be limited and the State should take its due share. Secondly, through extension and improvement of the tax system, steps must be taken to ensure that such incomes as do accrue are fully taxed, evasion of taxation is severely dealt with and opportunities for tax avoidance are reduced to the minimum.

34. With rapid development and expansion of employment, the incomes of the vast majority of workers in industry and services and of self-employed workers like farmers and skilled artisans may be expected to increase steadily and, on the whole, in fair relationship to productivity. Those receiving fixed incomes, falling broadly in the lower middle-class groups, inevitably face special problems on account of the long-term tendency towards rise in prices. On the other hand, in these groups, through women entering employment in larger numbers and the growth of employment, there are also wider openings for augmenting the family income. For this group, equally with those in the lowest income groups, it is important that the prices of essential commodities should be kept down and social services, especially education, health and housing, should be brought within easy reach. At the other end of the scale, the greatest attention must be given to those who are totally unemployed or suffer from serious under-employment. The provision of employment opportunities has the foremost priority for them. Along with employment, education and social service benefits should also be extended as fully as possible.

VII

ECONOMIC AND SOCIAL INTEGRATION

35. The socialist pattern of society provides a major line of advance in a developing economy, which is becoming increasingly complex, and in which there is constant interplay of a variety of social, economic and other elements. Its realisation is necessarily a cumulative process resulting from progress along many different paths. For several reasons, in reaching this goal there is need now for a sense of urgency and a quickening of pace. It is true that the economic foundations must be well laid if the social objectives are to be attained. At the same time, any marked lag between economic and social development creates new stresses. Precise data are at present lacking, and without these it is difficult to devise definite measures. Accordingly, an expert committee set up by the Planning Commission in October, 1960, is at present engaged in reviewing changes in the levels of living which have occured in the course of the First and the Second Plans, in studying recent trends in the distribution of income and wealth and, in particular, in ascertaining the extent to which the operation of the economic system may have resulted in concentration of wealth and means of production.

36. Progress along each separate course has its own limitations. Sometimes, there may be conflicts between different objectives and the means available for achieving them, and these have to be reconciled. Although many gaps remain, step by step within the scheme of planned development, the framework of socialism is being built up, but it has to be strengthened and made more purposeful in its actual working. There must be fuller and more determined implementation of accepted policies and programmes in all spheres of public administration and of economic life and more critical tests of evaluation should be adopted. Moreover, at all times there should be due stress on the moral, human and spiritual values which give meaning to economic progress. Given the necessary unity and discipline in the nation, willingness to bear the burdens of development and a greater understanding by different sections of the community of what is due from them at the present juncture, both economic and social advance can be far more rapid than is generally realised. Policies already initiated will go a long way to stimulate social mobility, strengthen such forces as the trade unions, the cooperative movement, voluntary organisations and the universities, and to create a broad-based constructive leadership in rural and urban communities. They will help to check concentration of economic power and the growth of monopoly, strengthen the bonds of cultural and economic integration, and assure to every citizen of India the right to work, to equal opportunity, and to a minimum level of living. In the last analysis, economic development is but a means to an end—the building up, through effort and sacrifice

widely shared, of a society, without caste, class or privilege, which offers to every section of the community and to all parts of the country the fullest opportunity to grow and to contribute to the national well-being.

37. Planning is a continuous process and cannot be isolated for short periods. Thus, the Third Five Year Plan is a projection and a continuation of the First and the Second Plans, and it will lead to the Fourth and subsequent Plans. Planning is a continuous movement towards desired goals and, because of this, all major decisions have to be made by agencies informed of these goals and the social purpose behind them. Even in considering a five-year period, forward and long-term planning has always to be kept in view. Indeed, perspective planning is of the essence of the planning process. As this process develops, there is a certain rhythm of expansion in the development of the people, and a sense of enterprise and achievement comes to them. They are conscious of a purpose in life and have a feeling of being participants in the making of history. Ultimately, it is the development of the human being and the human personality that counts. Although planning involves material investment, even more important is the investment in man. The people of India today, with all their burdens and problems, live on the frontier of a new world which they are helping to build. In order to cross this frontier they have to possess courage and enterprise, the spirit of endurance and capacity for hard work, and the vision of the future.

CHAPTER II

LONG-TERM ECONOMIC DEVELOPMENT

I

Need for a Perspective

Low levels of consumption, saving, productivity and employment, are different aspects of the central problem which India faces in common with other underdeveloped countries. Basically, the task is one of developing the natural and human resources of the country through the widest possible use of knowledge and technology, and improved organisation within the framework of a well-conceived long-term plan. A high and sustained rate of economic growth must be achieved in order to bring about a marked improvement in the level of living for the bulk of the population and to solve the problem of unemployment.

2. For several decades, the Indian economy was almost stagnant, developing at a rate barely exceeding the growth of population. Over the past decade it has advanced at an average rate of about 4 per cent per annum, the increase in aggregate national income being about 42 per cent. This modest increase in national income does not give a full indication of the growth potential of the economy built up specially during the Second Plan. While the income from agriculture and allied sectors, which accounts for almost one-half of the national income, has increased by a little over a third, the total income from the organised manufacturing sector has nearly doubled. Even within the sector of organised industry, the growth of the investment goods industries has been considerably faster than the average. However, as the increase in population has been greater than had been anticipated, income per head has increased only by about 16 per cent. Over the same period, due to the rapid progress of science and technology and the rates of growth secured in the advanced countries, the disparities between them and the less developed countries have widened. Experience of the past decade in India clearly shows that to make a significant impact on the level of living of the bulk of the people, the rate of economic development should be substantially stepped up, and special efforts should be made to reduce the rate at which population is increasing.

3. Against this background, it is useful to consider briefly the perspective of India's development, to attempt to identity the essential elements of the problem and to outline the approach to economic development over the next fifteen years or so. The process of development is a continuous one in which the priorities and objectives for each period are linked with a larger perspective. The real significance of the long-term perspective

lies in its value for current decisions which, in the absence of such a view, might be wrong and costly and might call for extensive corrections subsequently. A long-term plan when worked out in sufficient detail seeks to bring out the interdependence between the different sectors of the economy and assists in a clearer understanding of possible obstacles to the growth of the economy. By analysing problems of demand and supply arising from the growth of national output and the realisation of stated social objectives, it helps in taking consistent and timely decisions regarding the optimum uses of resources, the economies of scale and location, and regional distribution of economic activities. This last is particularly important because certain problems involving conflicts of a regional character in a large and diverse country like India can only be resolved in terms of a long-term plan which fits different regions into a larger design of national development. In particular, there is need for advance planning in specific terms for the industrial sector, including power, transport, scientific research and technical education. At each stage, the programmes of development in these fields have to be conceived of and accepted as a whole and extending beyond the given period. In these sectors there is constant need for coordinated effort, and the results are achieved over several years. While a long-term view of development is a useful guide in framing policies and programmes and assessing progress, it has itself to be reassessed from time to time in the light of actual achievement and experience.

4. Both the First and the Second Plans were described as phases in the long-term social and economic development of the country. The First Plan gave a simple projection of economic growth over a period of 30 years from 1951 to 1981. Certain assumptions were made concerning the rate of growth of population, the proportion of the increase in national income which might be ploughed back into investment at each stage of development, and the return by way of additional output on the investment undertaken. In this model of growth it was envisaged that the level of national income in 1950-51 could be doubled by 1970-71 and that of per capita income by 1977-78. The projections and assumptions of the First Plan were reviewed in the report on the Second Plan in relation to the performance of the economy, which went beyond the original expectations for the first five-year period, and it was suggested that, compared to 1950-51 the national income might be doubled by 1967-68 and per capita income by 1973-74. In view of the growth of population and the increase in national income actually realised during the ten years of the First and the Second Plans, it is essential that the expansion of the economy should be accelerated to the utmost extent feasible. Having regard to the increase in population and the likely trends, even with a sustained rate of growth in national income of around 6 per cent per annum, it would be difficult to fulfil the intention expressed in the Second Plan of doubling the 1950-51 level of income per head by the middle of the Fifth Plan.

5. In an underdeveloped economy with very little capital per person, a high rate of population growth makes it even more difficult to step up the rate of saving which, in turn, largely determines the possibility of achieving higher productivity and incomes. Moreover, for a given investment, a large proportion will need to be devoted to the production of essential consumer goods at the expense of investment goods industries, thereby still further slowing down the potential rate of growth.

The significance of population in relation to economic development may be judged from the results of the 1961 census. The increase in India's population between 1951 and 1961 (about 77 million) has been nearly as large as the increase (about 82 million) in the two preceding decades.

Early in 1959, on certain assumptions of birth rates and death rates, the Central Statistical Organisation (C.S.O.) had worked out a series of estimates of population growth which were accepted, pending the census, as a working basis for the preparation of the Third Plan. The following Table sets out these estimates of population growth along with a fresh set of projections provisionally worked out on the basis of the 1961 census results which may be used for purposes of planning until fuller studies can be undertaken on the basis of the detailed data obtained in the 1961 census.*

(in millions)

	1961	1966	1971	1976
C.S.O. estimates (1959)	431	480	528	578
provisional estimates (1961)	438	492	555	625

On the basis of the present tentative estimates for 1971 and 1976, over the period 1961—76, the total increase in population may be of the order of 187 million. Corresponding to the growth of population, it is estimated that the increase in the labour force over this period may be about 70 million, of which about 17 million will be during the Third Plan. Out of this addition to the labour force, some two-thirds would need to be absorbed outside agriculture. This will obviously be a formidable task calling for a fresh assessment of the scale and pace of development required over the next 15 years.

II

Approach to Long-term Development

6. On account of the various factors to which attention has been drawn above, it is imperative that over the next three plan periods all the possibilities of economic growth should be fully and effectively mobilised.

*The assumptions on which estimates of growth of population have been worked out are set out in a Note in Appendix C.

For this purpose it is essential to proceed on the basis of a broad strategy of economic development which will ensure that the economy expands rapidly and becomes self-reliant and self-generating within the shortest possible period. The strategy visualised for the Third and later Plans emphasises specially the interdependence of agriculture and industry, of economic and social development, of national and regional development, and of the mobilisation of domestic and external resources. It also places great stress on measures for scientific and technological advance and for raising the general level of productivity, as well as on policies relating to population, employment and social change.

7. *Agriculture and the rural economy.*—Development of agriculture, based on the utilisation of manpower resources of the countryside and the maximum use of local resources, holds a key to the rapid development of the country. Crop yields are at present so low that given adequate irrigation, supplies of fertilisers, improved seeds and implements, education of the farmers in using better methods, and reform of land tenures and development of the agricultural economy along cooperative lines, large increases in levels of production can be achieved over relatively short periods. In agriculture, as in the other sectors in which a large measure of progress can be realised through the fuller exploitation of resources available within the economy, the maximum increase in production physically possible should be secured. In the present stage of development, production of sufficient foodgrains as well as of cotton, oil-seeds and other commercial crops has equal urgency. Once the capacity to produce has been created, within a comparatively short period, it can be adapted to meet the changing needs of the community. Over the period, the aims to be achieved are the development of a diversified and efficient system of agriculture, including animal husbandry, dairying, production of meat, fish, poultry, etc., provision of a balanced and adequate diet for the entire population, and the development of commercial crops to meet the increasing requirements of industry and for exports.

8. Development of agriculture calls for extension of irrigation on a large scale. It is estimated that at present the technological possibilities of irrigation in terms of gross area irrigated extend to about 175 million acres, about 100 million acres being irrigated by large and medium irrigation schemes and the rest by minor irrigation schemes. The eventual requirements of chemical fertilisers needed for realising the benefits of irrigation and assured rainfall have been recently estimated at 4 million tons of nitrogen, 2 million tons of phosphatic fertilisers and a million ton of potassic fertilisers. Even after the possibilities of irrigation have been fully secured, at least one-half of India's cultivated land will depend upon rainfall, so that soil and moisture conservation must continue to receive very high priority in the scheme of development.

9. In any long-term view, the prospects of agricultural development are closely connected with the success achieved in:

(i) bringing about technological changes, specially the adoption of scientific agricultural practices and improved implements and other equipment;

(ii) fuller utilisation of manpower resources in rural areas and the organisation of the maximum local effort;

(iii) reorganisation of the rural economy along cooperative lines, including the provision of services, credit, marketing, processing and distribution, and cooperative farming;

(iv) improved utilisation of available land resources through systematic land-use planning, extension of multiple cropping and introduction of improved cropping patterns; and

(v) expansion of non-agricultural activities in rural areas so as to diversify the occupational structure and reduce dependence on agriculture.

These are already accepted goals and are being pursued, but in each direction, the effort must be intensified and speeded up.

10. *Basic and heavy industries.*—While agriculture and industry must be regarded as closely linked parts of the same process of development, there is no doubt that industry has a leading role in securing rapid economic advance. Because of her natural resources, India has considerable potential for industrial growth. She has extensive known reserves of iron ore, manganese, bauxite, coal, mica and atomic materials such as thorium ores. Surveys and exploration have already indicated the prospects of oil reserves. There is a large potential for hydro-electric power. With high grade iron ore available in considerable quantities India is able to produce her own steel at reasonable cost. Her potential capacity to produce steel and other basic materials relatively cheaply and the large and growing domestic market, place her in a favourable position to produce machinery and a large range of engineering, chemical and electrical goods needed for development. In turn, these will stimulate the growth of medium and small industries and expand employment both in urban and in rural areas. Thus, on foundations which have been already laid, it should be possible to build up an integrated industrial structure and expand industrial production efficiently along the lines of real comparative advantage However, until recently, the industrial sector had a narrow base with little development of basic and heavy industries. In view of the small size of the capital and intermediate goods industry, special emphasis has to be placed on industries such as steel, coal, oil, electric power, machine-building and chemicals. These must grow speedily if the requirements of further industrialisation are to be met in adequate measure from the country's own resources.In other words, development of these industries is an essential condition of self-reliant and self-sustained growth.

11. Industrial development, and specially the development of basic and heavy industries, must be regarded as part of a comprehensive design of development which ultimately links the industrial and the rural economy, the economy of large-scale and of small-scale units, and the economy of the major industrial centres as well as of the smaller towns and villages, bringing them into a close relationship with one another, thus assuring a high degree of mobility and economic integration within the economy as a whole.

12. *Human resources and productivity.*—An essential aspect of long-term planning is that effective and speedy means should be devised for lifting the level of productivity for the nation as a whole. Through this alone can the general level of well-being be effectively raised. At the base of this entire effort are the various programmes of development for building up the country's human resources, specially education and health, measures for the development of backward classes, and programmes for raising the levels of skills and technical know-how and for scientific and technological research. It may take twenty years or more to secure the required outturn of scientific and technical personnel and build up the foundations of scientific research. The programme of expansion of trained personnel in its widest sense has necessarily to be undertaken long in advance of requirements. It is equally important that the available man-power should be used as fully and effectively as possible. The importance of the expansion of facilities for general education can be scarcely exaggerated. While free and compulsory education is being introduced for children in the age group 6-11 years, and there has been marked progress already, the next step is equally vital, namely, the provision of universal education upto the age of 14 years as envisaged in the Constitution. This goal should be fulfilled in the course of the Fourth and Fifth Plans.

13. *Population.*—A large part of the increase in output is absorbed by the growth of population. Improvement in conditions of health and sanitation will further lower the death rate, specially the rate of infant mortality, and may for a time even tend to raise the birth rate. The objective of stabilising the growth of population over a reasonable period must therefore be at the very centre of planned development. The programme of family planning, involving intensive education, provision of facilities and advice on the largest scale possible and widespread popular effort in every rural and urban community has therefore the greatest significance.

14. *Employment.*—Lags in development in a country with a large population and heavy pressure of population on land are reflected most acutely in the problem of unemployment. Until the economic structure is strengthened and the economy is able to meet its growing requirements of equipment and raw materials largely from its own resources, it is difficult to abosrb even the entire addition to the labour force into increasingly productive work at a reasonable level of wages. In the period of

transition rural public works have an essential place in the scheme of development. It is hoped, however, that if development over the next three plan periods can be undertaken on the scale foreseen in this Chapter, it should be possible to expand opportunities of productive employment outside agriculture on an adequate scale.

15. *Social policy.*—In a country with a large rural population, extremely low living standards and widespread regional and cultural differences, the social aspects of development are not less important than the economic. A rapidly expanding economy is a necessary condition for resolving deep-rooted social problems. However, as it proceeds, economic development may widen disparities between rural and urban areas, increase differences in levels of development in different parts of the country, and accentuate the problems of economic inequality. The question of developing patterns of consumption appropriate to the social objectives has special significance in this connection. In any scheme of long-term development, these aspects must receive special attention, so that the social objectives outlined earlier are speedily realised.

16. *Resources for development.*—Among the principal conditions for building up a self-reliant economy, which can sustain a high rate of growth, are an adequate level of domestic capital formation, the maximum effort possible in developing exports, and availability of external assistance during the critical period of transition.

Progress in mobilising savings and in developing exports depends largely on the burdens which the community is willing to bear. As a result of development during the past decade the period of economic stagnation has been ended. For the bulk of the population, the existing levels of consumption are so low that a considerable proportion of the additional output of the economy must be devoted to the improvement of living standards. However, for many years to come, if the stock of capital and the economic and social services on which the growth of the economy depends are to be developed, only a limited rise in consumption standards will be possible, specially in commodities or services which are considered to be non-essential in the early stages of India's economic development. This is a choice which a democracy has to make with general consent in the larger interest of the community and, in turn, calls for appropriate social policies.

A basic objective in the strategy of development is to create the conditions in which dependence on external assistance will disappear as early as possible. A very large expansion in exports is essential for this purpose. The programme for the development of exports in the Third Plan aims at laying a strong foundation for a much larger export effort in the Fourth and the Fifth Plans. It involves restraints on consumption, measures to

make available the surpluses required for exports, and policies designed to raise productivity and reduce costs of production and distribution.

17. *External assistance.*—In the transitional period, the effort to develop the basic and heavy industries and machine-building capacity, without which the growth of the national economy would itself be retarded, accentuates the balance of payments problem. Replacement of imports is essentially a question of developing the necessary capacity for production within the country. A developing economy, which for its part endeavours to mobilise its own resources to the utmost extent possible, faces the difficulty that its developmental effort may entail a large increase in import requirements for specialised capital equipment and for raw materials and components, for which, for a period, it is unable to pay from its own export earnings. The need for external assistance is implicit in this situation. Such assistance has already done a great deal to hasten India's economic growth and its value can scarcely be over-estimated. Assistance from international agencies and from one country to another has a significance no less for the economic progress of the less developed countries than for the building up of a world community in which each country contributes to the development of others according to its capacity. This is an obligation which India fully accepts and, as her own economy develops, within the limits of her resources, she will endeavour to share her experience with other developing nations.

III

Outlook for 1961—76

18. At an earlier stage in the work on the Third Plan, following the suggestion in the Second Plan, a sustained rate of growth of 5 per cent per annum was visualised. With the rate of growth of population, which was assumed five years ago, this implied an increase in per capita income of a little less than 4 per cent per annum. It is now anticipated that over the next 15 years, population is likely to increase at more than 2 per cent per annum. Over this period the economy will be required to meet large and expanding demands in many fields—foodgrains and raw materials, cloth, steel, coal, power, transport, employment, education and other social services, and trained manpower. In the circumstances, it is considered that development over the next 15 years should be conceived in terms of a cumulative rate of growth as close as possible to 6 per cent per annum. This consideration has been generally kept in view in formulating physical programmes and targets for the Third Plan. If these were achieved fully and within the five year period as planned, the increase in the aggregate national income would be of the order of 34 per cent or about 6 per cent per annum. Among the important conditions to be met are the maintenance of conditions of economic stability

and keeping down of the costs of living for the bulk of the population, adequacy and timely availability of external resources, mobilisation of domestic savings of the order of over 12 per cent of the national income, fully coordinated execution of connected programmes under industry, transport and power, efficient implementation, at all levels, of agricultural and other programmes and, finally, improved techniques for planning and for the evaluation of performance. While it is vital to the success of the Third Plan that efforts in these directions should be intensified, the actual rate of growth will depend upon the measure in which the various conditions are fulfilled.*

19. Taking a broad view of the development of the Indian economy, it is reckoned that, at 1960-61 prices, the national income should rise from about Rs. 14,500 crores at the end of the Second Plan to about Rs. 19,000 crores at the end of the Third Plan, about Rs. 25,000 crores at the end of the Fourth and about Rs. 33,000 to 34,000 crores at the end of the Fifth Plan. Allowing for the increase in population, on these estimates income per head should go up from around Rs. 330 at the end of 1960-61 to about Rs. 385, Rs. 450 and Rs. 530 in 1966, 1971 and 1976. Increase in the volume and rate of investment implied in these estimates of national and per capita incomes will not be easy to achieve. However, against the background of resources and knowledge which science and modern technology provide and the greater understanding of social and economic processes now available, it is considered that the objectives set forth above are well within the range of practical fulfilment.

20. Development on the scale described above, which must indeed be improved upon in actual achievement, has several important implications. It calls for intensive and continuous effort to utilise fully the manpower resources of the country, to make the most efficient use possible of resources available for investment, to mobilise domestic savings and channel them into appropriate directions, and to secure adequate surpluses from internal production for expanding export. Net investments as a proportion of national income would have to rise from about 11 per cent at present to 14-15, 17-18, and 19-20 per cent per annum by the end of the Third, Fourth and Fifth Plans. In other words, as compared to about Rs. 10,500 crores postulated for the Third Plan, net investment over the Fourth and the Fifth Plan periods should be of the order of Rs. 17,000 crores and Rs. 25,000 crores. Domestic savings would have to rise in corresponding measure from about 8.5 per cent at present to about 11.5, 15-16, and 18-19 per cent of the national income at the end of the Third, Fourth and Fifth Plans. It is also implied that progressively external aid will form a diminishing proportion of the total

*The suggestion in Chapters IV and V that the Third Plan should aim at securing an increase in national income of 'over 5 per cent' per annum is in the nature of an overall judgment based on the consideration of these conditions.

investment, and by the end of the Fifth Plan the economy will be strong enough to develop at a satisfactory pace without being dependent on external assistance outside of the normal inflow of foreign capital.

21. As stated earlier, a considerable part of the practical interest of long-term plans lies in the guidance they provide for current action and decisions and in the forward planning which they facilitate. These considerations are of special importance in the basic industries. In these, technical and other problems involved in coordinated development, implications in terms of physical resources and foreign exchange, and questions relating to the location of economic activities call for prolonged study and preparation. In the course of preliminary studies on the Third Plan the following tentative targets of capacity have been suggested for some important items for 1970-71 :

item	unit	capacity target
steel ingots	million tons	18—19
pig iron	million tons	3—4
aluminium	thousand tons	230—250
electric power	million kW	21—23
coal	million tons	170—180
oil refining	million tons	18—20
nitrogenous fertilisers	million tons (N)	2·0—2·2
cement	million tons	24—26
machine-building	Rs. crores of output	1600
railway freight transport—long distance originating traffic	million tons	380—420
foodgrains	million tons	125
exports	Rs. crores	1300—1400

These targets indicate the order of effort called for and could form a useful basis for further studies at the technical level.

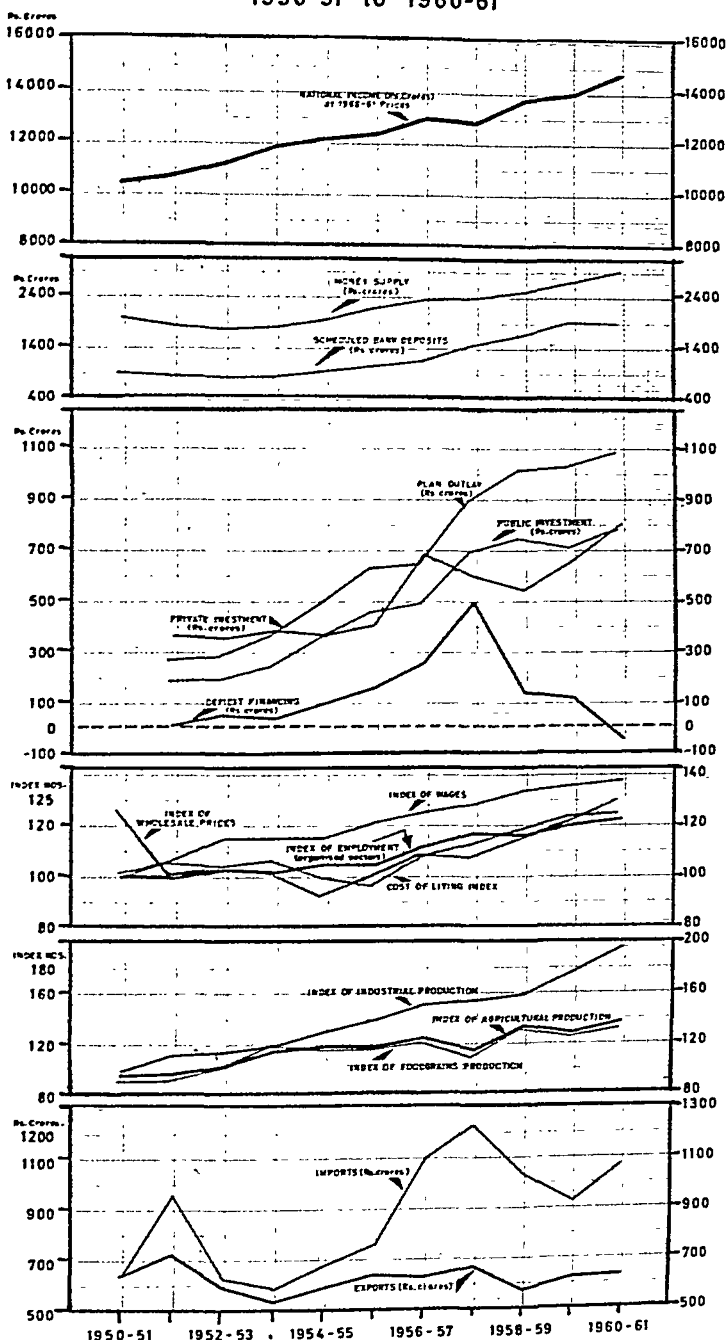
IV

Preparation of a Long-Term Development Plan

22. In recent years considerable progress has been made in developing new techniques and concepts for the formulation of long-term plans of development. Their use for purposes of economic planning depends largely on the quality of the statistical and technical information available. Accordingly, in the Third Plan special steps are being taken to improve the available statistical and technical data. These will be particularly required for analysing the complex relationships, and correct proportions between different branches of the developing economy. In each stage of development the whole programme has to be viewed as a continuous physical process. The right quantities of raw materials, intermediate products, machinery and essential services such as power and transport as well as the requisite trained personnel have to be available at the right time; the outputs of all sectors of the economy

have to be utilised either for investment or for consumption at the right time; the availability of domestic savings and of foreign exchange have to satisfy the requirements of production and consumption at the right time. A considerable amount of economic, technical and statistical analysis has to be undertaken. This would include estimation of the demand for goods and services by consumers at the end of each given period, studies of inter-industry relations with a view to ascertaining the demand for intermediate goods, raw materials, and technical personnel and determination of investment requirements as well as possibilities of import saving and the development of exports.

23. A long-term plan of development embodying specific programmes and policies is an essential condition of successful planning for a country with deep-rooted social and economic problems, a large and growing population and widely varying conditions. Such a plan should be conceived not merely in broad national terms but should take into account the possibilities of development of resources in different regions of the country so as to spread the benefits of development as widely as possible without slowing down growth itself. The long-term plan should therefore supply a general pattern of economic and social development which would take into consideration the needs and possibilities of different areas and harmonise these into an integrated endeavour for national advancement. For working out a long-term plan on these lines, there is need for close and continuous collaboration between various Government agencies at the Centre and in the States and leading institutions engaged in scientific, economic and social research. The outline of the long-term plan will be filled in as more data and knowledge become available, and the Plan itself will be adjusted from time to time, in keeping with technological developments, greater knowledge of resources and the progress achieved in different branches of the economy. Work along these lines has already been initiated in the Planning Commission as well as by independent research institutions, and in the course of the next three years it is proposed to devote substantial resources to the preparation of an overall plan of development covering the period upto the end of the Fifth Plan.



SELECTED ECONOMIC INDICATORS
1950-51 to 1960-61
16000
14000
12000
10000
8000
MONEY SUPPLY (Rs. crores)
SCHEDULED BANK DEPOSITS (Rs. crores)
2400
1400
400
1100
900
700
500
300
100
0
-100
PLAN OUTLAY (Rs. crores)
PUBLIC INVESTMENT (Rs. crores)
PRIVATE INVESTMENT (Rs. crores)
DEFICIT FINANCING (Rs. crores)
125
120
100
80
140
INDEX OF WAGES
INDEX OF WHOLESALE PRICES
INDEX OF EMPLOYMENT (organised sectors)
COST OF LIVING INDEX
180
160
120
80
200
INDEX OF INDUSTRIAL PRODUCTION
INDEX OF AGRICULTURAL PRODUCTION
INDEX OF FOODGRAINS PRODUCTION
1200
1100
900
700
500
1300
IMPORTS (Rs. crores)
EXPORTS (Rs. crores)
1950-51
1952-53
1954-55
1956-57
1958-59
1960-61

CHAPTER III

TEN YEARS OF PLANNING

First and Second Plans

The completion of the Second Five Year Plan in March, 1961, marked also the end of the first decade of India's planned development. During this decade there has been rapid expansion of the Indian economy, the outlines of the country's future social and economic structure have been established, and foundations have been laid for the achievement of the basic objectives and the long-term economic goals set out in the preceding Chapters.

2. The First Five Year Plan took over several projects which had been worked out earlier and integrated them into a well-knit scheme of economic and social development embracing every part of the country. Through its emphasis on agriculture, irrigation, power and transport, the Plan aimed at creating the base for more rapid economic and industrial advance in the future. In stressing the place of social change and institutional reforms in the economic development of the country, the Plan initiated some of the basic policies which were further developed under the Second Plan.

The reform of an antiquated land system which was inhibiting agricultural production, setting up a nation-wide agricultural extension service as part of a comprehensive community development programme, revitalisation of the cooperative movement, expansion of irrigation and power facilities on a large scale, strengthening and improving the administrative structure of the country, and establishing a number of specialised institutions for providing credit to agriculture and industry, for developing small scale industries and for giving special assistance to backward sections of the population were some of the notable features of the First Plan. The Plan focussed the nation's attention on the vital need for planned effort for achieving rapid economic growth as well as social justice. It offered to the people not only the objectives for which to work, but also the means with which to realise them through mutual self-help and cooperation and the mobilisation of local resources.

3. While the Second Plan carried the basic policies initiated under the First Plan a step further and aimed at a larger increase in invest-

ment, production and employment, its main contribution was to direct the economy towards the next important stage which followed logically from the policy of planned development which the country had already accepted. It placed special emphasis on the development of basic and heavy industries for, with the advantages in natural resources which India already possessed, this was an essential element in the strategy for speeding up the development of the national economy over the next 15 or 20 years. The Plan also defined more clearly the key role that the public sector was to play in the economic development of the country. Along with the emphasis that it put on accelerating the rate of growth of the national economy and creating conditions for more rapid development in future, the Second Plan placed before the nation the goal of the socialist pattern of society. It also set the objectives of increasing employment opportunities and reducing disparities in income and wealth and bringing about a more even distribution of economic power.

4. As a result of economic planning, there was a substantial increase in the rate of investment, especially in directions calculated to accelerate the economic development of the country. The total investment, public and private, in the economy increased from over Rs. 500 crores per annum at the beginning of the First Plan to Rs. 850 crores at its end and reached an annual level of about Rs. 1600 crores at the end of the Second Plan. Corresponding figures for investment by public authorities are about Rs. 200 crores, Rs. 450 crores and Rs. 800 crores. Reckoned at current prices, the total investment during the two Plans was Rs. 10,110 crores, Rs. 5210 crores in the public sector and Rs. 4900 crores in the private sector. Details for the two Plans are given below:

Table 1: Outlay and investment in First and Second Plans*

(Rs. crores)

sector	First Plan 1951-56	Second Plan 1956-61	total 1951-61
public sector outlay	1960	4600	6560
public sector investment	1560	3650	5210
private sector investment**	1800	3100	4900
total investment	3360	6750	10110

*At current prices

**Private sector investment was shown earlier at Rs. 1600 crores for the First Plan and at Rs. 2400 crores for the Second Plan. These estimates have been revised in the light of fuller information. They exclude transfers from the public sector.

5. The distribution of outlay in the public sector as between different heads of development is shown in the following Table:

Table 2: Distribution of outlay

(Rs. crores)

head	First Plan expenditure	First Plan percentage	Second Plan expenditure	Second Plan percentage
agriculture and community development	291	15	530	11
major and medium irrigation . .	310†	16	420	9
power	260	13	445	10
village and small industries . .	43	2	175	4
industries and minerals . . .	74	4	900	20
transport and communications . .	523	27	1300	28
social services and miscellaneous . .	459	23	830	18
total	1960	100	4600	100

The changes in distribution of outlay reflect the changes in emphasis in the two Plans. In the First Plan relatively greater stress was placed on programmes designed to build up the agricultural potential of the country. Consequently, programmes for agriculture and irrigation comprised 31 per cent of the Plan outlay. In the Second Plan, greater emphasis was given to industrial development and the relative share of industries and minerals increased from 4 per cent to 20 per cent. Transport and communications were given high priority in both the Plans. Social services and miscellaneous heads comprised 23 per cent of the First Plan outlay and 18 per cent of the Second Plan outlay.

PATTERN OF FINANCING

6. The financing of the public sector outlay in the two Plans was as follows:

Table 3: Financial resources in the public sector

(Rs. crores)

	First Plan actual	First Plan percentage	Second Plan estimated	Second Plan percentage
outlay on the Plan	1960	100	4600	100
internal resources	1772	90	3510@	76
external assistance	188	10	1090*	24

†Includes flood control.

@Includes subscritpions to Government loans by (i) Reserve Bank and by (ii) State Bank out of P.L. 480 deposits.

*Includes investment of P. L. 480 funds in 1960-61 by Reserve Bank in special securities.

During the Second Plan in particular, there was a substantial step-up in the tax effort. A number of new direct and indirect taxes were introduced. The gap in resources was made up partly through deficit financing and partly through external assistance. During the earlier years of the Second Plan, budgetary deficits were rather high. An attempt was, however, made in the later years to reduce them. Actual deficit financing during the Second Plan was roughly of the order of Rs. 948 crores.

7. The balance of payments did not present a problem during the First Plan period. The actual deficit amounted to Rs. 318 crores over the Plan period. It was met to the extent of Rs. 196 crores by external assistance and Rs. 122 crores by withdrawals from the country's foreign exchange reserves. The Second Plan which put greater stress on industrialisation naturally required heavier expenditure of foreign exchange. The Second Plan Report estimated the aggregate deficit in the balance of payments over the five-year period at about Rs. 1100 crores and assumed that about Rs. 800 crores out of this would be met by external assistance. The Plan ran, however, into unexpected balance of payments difficulties from the very start and had to be reappraised in 1958. Stringent restrictions had to be imposed on less essential imports. Foreign exchange reserves had to be drawn down by Rs. 600 crores in the Second Plan period. In addition, external assistance of the order of Rs. 872 crores was utilised in the public as well as private sectors, besides commodity imports of Rs. 534 crores under the P.L. 480 assistance and net drawals from the International Monetary Fund of the order of Rs. 55 crores.

8. The record of growth over the last ten years has not been uniform. There have been significant ups and downs—occasionally due to natural causes or international developments and sometimes due to deficiencies in implementation. During the First Plan, owing largely to the progress recorded by agricultural production, the national income increased by 18 per cent as against a target of 12 per cent. During the Second Plan, on the other hand, the increase in national income was 20 per cent as against a target of 25 per cent.

9. Taking the decade as a whole, however, the picture is one of overall progress. Basic facilities like irrigation, power and transport which are essential for agricultural and industrial development have been greatly expanded. Valuable mineral deposits have been opened up to feed industries, small and large. A number of projects have been completed in spite of delays caused chiefly by the foreign exchange crisis and have either already come into production or will do so in the immediate years ahead. Agricultural production has expanded by about 41 per cent and output of foodgrains by 46 per cent. The net output of organised manufacturing industries has nearly doubled. The share of the public sector industries in it has gone up from 1·5 per

cent to 8·4 per cent and much of this increase has been in key industries like steel, coal mining and heavy chemicals. This has been accompanied by a large expansion of electric power generating capacity and considerable improvement in the expansion of the country's transport and communications system, mainly in the public sector. There has been a general expansion of organised industries and the paid up capital of companies at work has more than doubled. At the same time, there has been also substantial development in village and small industries. Facilities for education and technical training have become much more widespread than before. The number of hospitals and dispensaries has significantly increased, special measures have been taken to eradicate malaria, and there has been a general improvement in health conditions, resulting in substantial increase in the survival rate. The increase in national income has been 42 per cent over the last decade; but, owing to the increase in population, the increase in income per capita has been 16 per cent.

10. A general view of the growth of the economy over the last decade may be obtained from the selected indicators given in the Table below and the data set out more fully in Annexure I to Chapter V.

Table 4: Selected indicators of growth

item	unit	1950-51	1955-56	1960-61	percentage increase in 1960-61 over 1950-51
national income at 1960-61 prices	Rs. crores	10240	12130	14500	42
population	millions	361	397	438	21
per capita income at 1960-61 prices	Rs.	284	306	330	16
index of agricultural production	1949-50=100	96	117	135	41
foodgrains production	million tons	52·2*	65·8*	76·0	46
nitrogenous fertilisers consumed	000 tons of N	55	105	230	318
area irrigated (net total)	million acres	51·5	56·2	70·0	36
cooperative movement :					
advances to farmers	Rs. crores	22·9	49·6	200·0	773
index of industrial production	1950-51=100	100	139	194	94
production of :					
steel ingots	million tons	1·4	1·7	3·5	150
aluminium	000 tons	3·7	7·3	18·5	400
machine tools (graded)	value in Rs. crores	0·34	0·78	5·5	1518
sulphuric acid	000 tons	99	164	363	267
petroleum products	million tons	—	3·6	5·7	..

*Estimates of production adjusted for changes in statistical average and methods of estimation upto 1956-57.

item	unit	1950-51	1955-56	1960-61	percentage increase in 1960-61 over 1950-51
cloth :					
mill-made	million yards	3720	5102	5127	38
khadi, handloom and powerloom	million yards	897	1773	2349	162
total	million yards	4617	6875	7476	62
minerals :					
iron ore	million tons	3·2	4·3	10·7	234
coal	million tons	32·3	38·4	54·6	69
exports	Rs. crores	624	609	645	3
power : installed capacity	million kW	2·3*	3·4*	5·7	148
railways : freight carried	million tons	91·5	114·0	154·0	68
roads : surfaced including national highways	000 miles	97·5	122·0	144·0	48
commercial vehicles on road	000 numbers	116	166	210	81
shipping	lakh GRT	3·9	4·8	9·0	131
general education : students in schools	million numbers	23·5	31·3	43·5	85
technical education :					
engineering and technology—degree level—intake	000 numbers	4·1	5·9	13·9	239
health :					
hospital beds	000 numbers	113	125	186	65
doctors (practising)	000 numbers	56	65	70	25
consumption levels :					
food	calories per capita per day	1800	1950	2100	17
cloth	yards per capita per annum	9·2	15·5	15·5	68

The progress achieved in different sectors of the economy is briefly reviewed below.

Agriculture

11. The trend of agricultural production since 1949-50 is shown in the following Table:

Table 5: Index number of agricultural production
(1949-50=100)

group	1950-51	1955-56	1960-61
all crops	96	117	135
food crops	91	115	132
other crops	106	120	142

In spite of fluctuations from year to year, there was unmistakable evidence of expansion. The cumulative rate of growth was about 3·5

*Figures relate to calendar years, 1950 and 1955.

per cent per annum and was much higher than in any previous decade. The average level of foodgrains production of about 50 million tons in the preceding decade was exceeded early in the First Plan and amounted to over 76* million tons in 1960-61 as against 57.6 million tons in 1949-50 and 52·2 million tons in 1950-51. The yield per acre also rose significantly over the decade. The average yield of rice per acre, for example, increased from 694 lb in the quinquennium 1946-47 to 1950-51 to 727 lb during the First Plan period and 807 lb in the Second Plan period. The increase in production of major agricultural commodities has been as follows:

Table 6: Production of major crops

crop	unit	1950-51	1955-56	1960-61
foodgrains (cereals and pulses)	million tons	52·2	65·8	76·0
oilseeds	million tons	5·1	5·6	7·1
sugarcane (gur)	million tons	5·6	6·0	8·0
cotton	million bales	2·9	4·0	5·1
jute	million bales	3·3	4·2	4·0

12. The total outlay on agriculture, community development and irrigation amounted to Rs. 1551 crores during the decade. The principal agricultural production programmes undertaken related to extension of irrigation, supply of chemical fertilisers, development of local manurial resources, multiplication and distribution of improved seeds, adoption of improved agricultural practices and land reclamation and development.

13. The net area irrigated is estimated to have increased from 51·5 million acres in 1950-51 to about 70 million acres in 1960-61. The major and medium irrigation projects started in the First and Second Plans, are expected to create potential for irrigation of about 38 million acres on full development. About 4 million acres were reclaimed by the end of 1960-61. Mechanical cultivation was extended to 0·5 million acres and land improvement to about 1·5 million acres. About 4000 seed farms were established under a scheme to cover the entire cultivated area of the country with improved seeds. The consumption of nitrogenous fertilisers (in terms of N) increased from 55,000 tons to 230,000 tons and of phosphatic fertilisers (in terms of P_2O_5) from 7000 tons to 70,000 tons between 1950-51 and 1960-61. Attention was also given to the development of urban compost and local manurial resources. By the end of the Second Plan 11·8 million acres were estimated to have been brought under green manuring. About 2·7 million acres were

*Latest estimates indicate that foodgrains production in 1960-61 may be over 78 million tons.

covered by soil conservation measures. Measures were also taken for the development of livestock and fisheries, milk supply, vegetable and fruit cultivation and afforestation. For example, production of milk went up from 17 million tons to 22 million tons and of fish from 0·7 million tons to 1·4 million tons. Afforestation programmes covered about 0·5 million acres.

14. Besides the formulation and implementation of programmes for development, the First and Second Plans also envisaged a reorganisation of the agrarian structure. Measures in this direction consisted of the abolition of intermediaries (such as zamindars and jagirdars), protection and improvement of tenancy rights and the imposition of ceilings on land holdings. Efforts were also made in several States to encourage consolidation of holdings. The programme for ameliorating the economic condition of agricultural labourers included settlement on fallow and reclaimed lands and fixation of statutory minimum wages.

15. Among the most significant developments in the agrarian economy during the past decade, mention may be made of the introduction of the extension services throughout the country as an integral part of the community development movement and democratic decentralisation of rural development work. At the end of the Second Plan the community development movement covered about 370,000 villages and well over half of the country's rural population. About 60,000 village level workers and technical officers were given special training in extension work. To carry this programme further and make it more effective, responsibility for development is being transferred to people's institutions at and below the district level, so as to secure complete involvement of the people both in the formulation and implementation of development programmes. The village would constitute the primary unit and the responsibility and initiative for social and economic development at the village level would be placed fully on the village panchayat and the village cooperative. The cooperative movement has made considerable progress during the last decade. By the end of the Second Plan, there were 210,000 primary agricultural societies—almost double the number in 1950-51. About 1870 cooperative marketing societies and 41 cooperative sugar factories were set up. A number of useful experiments were initiated in cooperative farming and a National Cooperative Farming Advisory Board was established to promote the growth of cooperative farming.

INDUSTRY

16. The past decade has witnessed striking development in industry—in terms of the rate as well as the pattern of industrial growth. Some

idea of the trend may be obtained from the following indices of industrial production:

Table 7: Index number of industrial production*
(1950-51 = 100)

group	1955-56	1960-61
general index	139	194
cotton textiles	128	133
iron and steel	122	238
machinery (all types)	192	503
chemicals	179	288

17. The index number of industrial production thus recorded a cumulative rate of expansion of about 7 per cent per annum. The actual increase was, in fact, more pronounced than indicated by the above figures, because a number of new industries which have generally shown more marked progress, are at present not adequately provided for in the index.

18. Even more significant than the quantum of industrial development has been the direction in which the expansion has taken place, especially under the Second Plan. During the First Plan period what had been initially proposed for large industry was chiefly to encourage the already existing factories to use their capacity to the full. Industrial production, even with this mild stimulation, rose by 39 per cent during the quinquennium.

19. With the successful completion of the First Plan, it was possible to take up in a large way the development of new industries, especially the capital and producer goods industries, which constitute the basis for any programme for accelerated industrial growth. Judging by the progress so far achieved by the metallurgical, mechanical and electrical engineering and chemical industries in augmenting industrial potential and taking cognisance of the heavy machine-building projects recently initiated, it can be stated that some of the basic conditions required for an accelerated growth towards the goal of a self-reliant economy have been successfully established over the last decade.

20. A key role was assigned to the public sector in the development of basic and heavy industries. Total public sector outlay on industries and minerals amounted to Rs. 974 crores over the decade. Investment in the Second Plan period alone amounted to as much as Rs. 870 crores in the public sector or 56 per cent of the total investment in organised

*This index is the same as the official index except that the comparison base has been changed from the calendar year 1951 to the financial year 1950-51 so as to facilitate measurement of growth over the Plan periods.

industry, public and private. What is more important, most of the public sector industries were of a heavy or basic type. This development has not only helped to strengthen the public sector, but also to create conditions conducive to a rapid growth of medium and light industries in the private sector.

21. A major step forward was taken with the establishment of three new steel plants in the public sector and the expansion of the two units in the private sector. The new projects have now reached the stage of production and the output of steel ingots has increased from 1·4 million tons in 1950-51 to 3·5 million tons in 1960-61 and of pig iron from 3·5 lakh tons to 9 lakh tons. The availability of other essential industrial materials like aluminium, cement, heavy chemicals and dyestuffs, of fuels such as coal and petroleum, and of power has also increased substantially since 1950-51.

22. Another significant development has been the rapid growth of machine-building industries. India is now producing progressively increasing quantities of machine tools and machinery for use in agriculture and transport and for such industries as chemicals and pharmaceuticals, textiles, jute, cement, tea, sugar, flour and oil mills, paper, mining etc. Indigenous manufacturing capacity now exists for most of the machinery and equipment needed by the railways, except diesel and electric locomotives. A large variety of electrical equipment and scientific instruments are also now being produced in the country. The value of graded machine tools produced in the country has increased from Rs. 34 lakhs in 1950-51 to Rs. 550 lakhs in 1960-61. Steps have been recently taken for the establishment of a heavy machine-building plant and the foundry/forge plant at Ranchi and the coal mining machinery plant at Durgapur. The aggregate value of the various kinds of industrial machinery and capital goods was eleven times as much as at the beginning of the decade. The Heavy Electrical Project at Bhopal has entered the stage of initial production. When all stages are completed Rs. 25 crores worth of equipment will be produced.

23. The progress made by chemical industries, particularly pharmaceuticals, heavy chemicals and fertilisers, has also been significant and capacity of production for a wide range of primary organic chemicals has been stepped up.

24. Modernisation and re-equipment of important industries, such as jute, cotton textiles and sugar have made progress. In the case of the jute industry, the programme is at an advanced stage on the spinning side. The bulk of the machinery required for the modernisation of the jute industry in the preparatory and spinning departments has been manufactured within the country.

25. Another achievement during the period under review was the progress made in increasing the indigenous content of industrial products manufactured in the country. Yet another indicator of the country's industrial development is the production of a growing number of new industrial items e.g. industrial boilers, milling machines and other types of machine tools, tractors, industrial explosives, sulpha and antibiotic drugs, D.D.T., newsprint, motor-cycles and scooters, calcium carbide, dyestuffs, staple fibres, etc.

26. There has been also considerable progress in consumer industries. The production of older industries like textiles and sugar recorded substantial expansion. Yet more rapid progress was made in industries manufacturing durable items such as automobiles, bicycles, motor-cycles, scooters, fans, radios, electric lamps and sewing machines.

27. The following Table gives some idea of the progress made in *the production of important producer and consumer goods during the* last decade:

Table 8: Production in selected industries

item	unit	1950-51	1960-61
steel ingots	million tons	1·4	3·5
aluminium	000 tons	3·7	18·5
diesel engines	000 numbers	5·5	40
electric cables (ACSR conductors)	000 tons	1·7	22·0
nitrogenous fertilisers (in terms of N)	000 tons	9	110
phosphatic fertilisers (in terms of P_2O_5)	000 tons	9	55
sulphuric acid	000 tons	99	363
cement	million tons	2·7	8·5
cotton textiles (mill-made)	million yards	3720	5127
sugar *	million tons	1·1	3·0
paper and paper board	000 tons	114	350
bicycles (organised sector only)	000 numbers	101	1050
automobiles	000 numbers	16·5	53·5

MINERALS

28. Another notable feature of the period under review was the attention given to mineral exploitation and production. The organisations for the exploration, assessment and exploitation of the country's

*Relates to crop year, November-October.

mineral resources were considerably strengthened. The principal minerals in respect of which more successful exploitation and production were recorded were coal, iron ore and bauxite. The production of coal increased from 32·3 million tons in 1950-51 to 54·6 million tons in 1960-61 and of bauxite from 64,000 tons in 1950 to 377,000 tons in 1960. Most of these increases took place in the Second Plan period.

29. While the output of mineral oil within the country is as yet small, valuable oil resources have been found in Nahorkatiya area in Assam and indicators obtained of a sizeable oil field in Cambay–Ankleshwar area in Gujarat. Prospecting operations are in progress in other areas as well. In view of the importance of establishing indigenous sources of oil, an Oil and Natural Gas Commission was set up for undertaking, on an intensified scale, geological surveys, geophysical investigations and exploratory drilling for oil. Construction of two refineries at Nunmati and Barauni was taken up in the public sector and the Indian Oil Company, a Government agency for the distribution of oil products, was formed in 1959.

Village and Small Industries

30. The development of village and small industries as an integral element in an expanding national economy has been from the beginning, one of the key programmes under the Five Year Plans. They were expected to lead to fuller use of local resources, meet a significant part of the expanding demand for consumer goods, form a vital link between agriculture and large-scale industries, and provide increasing opportunities for employment—both in rural and in urban areas. During the last decade, Rs. 218 crores have been spent by Government for the development of these industries. All-India Boards were set up with a view to formulating, guiding and, to an extent, implementing coordinated programmes for the development of small scale industries, handloom industry, khadi and village industries, handicrafts, coir and sericulture. An industrial extension service was developed and Small Industries Service Institutes were set up in every State and 53 Extension Centres were also established. About 60 industrial estates comprising over 1000 small factories using power were established. Special arrangements were made for the provision of credit, technical advice and raw materials and the supply of imported and indigenous machines on hire-purchase terms. The growth of a vigorous class of small entrepreneurs was a significant development of the last ten years. In a number of industries, notably, machine tools, sewing machines, electric motors and fans, bicycles, builders' hardware and hand tools, there have been increases in production varying from 25 to 50 per cent during the last five years. Production would have been much larger but for the shortage of some basic raw materials like steel and non-ferrous metals. Among the tradi-

tional industries, which provide considerable employment, the production of handloom cloth increased from 742 million yards to about 1900 million yards, of khadi from 7·3 million yards to 74 million yards and of raw silk from about 2·5 million lb to 3·6 million lb between 1950-51 and 1960-61. Steps were taken during this period to introduce a scheme for enlarging credit facilities for small scale industries from banking agencies by providing Government guarantee, to assist weavers' cooperatives to purchase powerlooms and to manufacture and distribute an improved type of spinning wheel (Ambar charkha).

POWER

31. Provision of adequate power is one of the basic requirements for the development of both large and small scale industries. A number of hydro-electric and thermal power projects were constructed during this period and the total public sector investment in power amounted to Rs. 705 crores. The four multi-purpose projects, Damodar Valley, Bhakra-Nangal, Tungabhadra and Hirakud, which were begun before the First Plan, were incorporated in the integrated programme of river valley development. Among the river valley projects started during the last decade, mention may be made of Chambal, Rihand, Koyna and Nagarjunasagar. A large programme for thermal power generation was also undertaken. The installed capacity of hydro-electric power increased from 0·56 million kW to 1·93 million kW and of termal power from 1·74 million kW to 3·77 million kW during the last decade. The total installed capacity thus rose from 2·3 million kW in 1950 to 5·7 million kW in 1960-61. Impressive as this increase was, it fell substantially short of the target of 6·9 million kW. The shortfall is mainly due to foreign exchange difficulties that arose during the early years of the Second Plan and also delays in the execution of some of the major projects. Special attention was paid to extending electricity to rural areas as this was considered to be an important measure for developing and modernising the rural economy. The total number of towns and villages electrified went up from 3687 in 1950-51 to 23,000 in 1960-61.

TRANSPORT AND COMMUNICATIONS

32. Considerable improvement and expansion of the country's transport system took place during the past decade. The total public sector outlay was Rs. 1823 crores. The main task under the First Plan was the rehabilitation and replacement of rolling stock and fixed assets of the railways which had been subjected to severe strain on account of the War and the Partition. To meet the growing demands of the agricultural and industrial sectors, additional facilities were provided by increasing rolling stock and constructing new lines during the Second Plan. There was also substantial expansion in road transport, shipping and air services.

An idea of the development of the transport services during the last decade may be obtained from the following Table:

Table 9: Transport

item	unit	1950-51	1955-56	1960-61
railways				
new lines added	miles	..	380*	800*
rolling stock :				
locomotives. . . .	000 numbers	8·5	9·2	10·6
coaches	000 numbers	20·5	23·2	28·2
wagons	000 numbers	222·4	268·5	341·0
passenger miles . .	billions	41·3	38·8	48·6
freight carried . . .	million tons	91·5	114·0	154·0
roads				
surfaced including national highways	000 miles	97·5	122·0	144·0
unsurfaced	000 miles	151·0	195·0	250·0
road transport				
commercial vehicles on road	000 numbers	116	166	210
shipping				
tonnage	lakh GRT	3·9	4·8	9·0
major ports				
capacity	million tons	20	25	37

33. The expansion of industrial and commercial activity had its impact on the demand for communication facilities. The number of postal articles handled increased by about 80 per cent and of trunk telephone calls by about fivefold between 1950-51 and 1960-61. The number of post offices increased from 36,000 to 77,000 and of telephones from 168,000 to 460,000. Appreciable progress was also achieved in broadcasting. Each language area was provided with one transmitting station and there were as many as 28 stations in 1960-61. A programme for the provision of community listening sets in rural areas was taken up. The number of radio licences increased by about fourfold during the period.

Social Services

34. The development of the human resources of the country through the provision of facilities for education, health and social welfare is one of the major objectives of planned development. In the First as well as the Second Five Year Plans, considerable importance was attached to social services and altogether Rs. 1289 crores were spent for their development during the decade, but undoubtedly the needs to be met were much larger.

*Relates to the quinquennium ending 1955-56 and 1960-61 respectively.

35. *Education.*—There was all-round development of education. The number of students in schools increased from 23·5 million in 1950-51 to as many as 43.5 million in 1960-61—an increase of 85 per cent. The proportion of children attending schools in the age group 6—11 increased from 42·6 per cent to 61·1 per cent and in the age group 11-14 from 12·7 per cent to 22·8 per cent. The number of primary schools increased from 210,000 to 342,000 while that of high and higher secondary schools from 7300 to 17,000. The number of universities increased from 27 to 46 and of colleges (excluding intermediate colleges) from 542 to 1050.

36. Special emphasis was placed on developing facilities for technical education which is the very basis of industrial development. Facilities in existing institutions were expanded and improved and 51 new degree colleges and 110 polytechnics were opened during the last ten years. The total intake of students in these institutions increased from 10,000 in 1950-51 to 39,400 in 1960-61. The outturn of engineering graduates increased by about three times and that of diploma holders expanded more than threefold. Technical training facilities were provided in a number of industrial establishments in the public sector, particularly, in the steel and electrical plants. Special training facilities were also provided for various small scale industries. The annual intake of agriculture and veterinary colleges increased about fourfold.

37. *Scientific research.*—The promotion of scientific and technological research was given a high priority and a large number of new research institutions was established. These include 20 national laboratories and 3 regional research centres. Notable progress was made in basic and applied research in nuclear science and the peaceful uses of atomic energy, and a strong scientific and technical organisation was built up, which enabled the design and development of instruments and plants required for this work without foreign technical consultancy. The research departments of universities were also strengthened considerably.

38. *Health.*—There was a considerable expansion of health services. A large number of new hospitals, dispensaries, health units and maternity and child welfare centres were opened and special programmes for water supply and sanitation, control of communicable diseases and expansion of training facilities were undertaken. In 1950-51, there were 8600 medical institutions with about 113,000 beds. In 1960-61, the number increased to 12,600 institutions with 185,600 beds. In addition, 2800 primary health centres were opened. The number of medical colleges increased from 30 to 57 and that of doctors in practice or in service increased from 56,000 to 70,000. The entire population was covered by the malaria eradication programme. As a result of all these measures, the average expectation of life at birth improved by about 10 years over the last decade.

39. Early in the First Plan, the promotion of family planning was adopted as a public policy and by 1960-61 there were 549 urban centres and 1100 rural centres engaged in family planning service. A number of non-official organisations engaged in family planning work were given special financial and technical assistance. The programme, however, is a most difficult one to carry out and raises problems of great complexity. Sustained and intensive efforts are required over a fairly long period before family planning can become a popular movement and a part of the accepted attitudes of the people generally.

40. *Housing.*—As a result of the growth of population as also accelerated rate of urbanisation and industrial development, the housing problem became increasingly difficult. Certain measures were taken for slum clearance and improvement and for providing housing facilities for industrial workers and low-income groups. A small beginning was also made to deal with the problem of rural housing. However, the resources that could be spared for this purpose were small compared to the magnitude of the problem. The impact so far has been negligible and the problem of housing, especially in urban areas, is causing concern.

41. *Welfare of backward classes.*—Special welfare programmes were undertaken for scheduled tribes, Harijans and other backward classes. An area of 3·6 million acres of land was allotted to members of scheduled castes and scheduled tribes and another 2·6 million acres allotted to other backward classes during the period. About 68,000 post-matric scholarships were awarded to students of these classes. Members of these classes who faced special difficulties were helped, through financial assistance, educational facilities and employment opportunities, to improve their social and economic position and get fully integrated with the rest of the community.

42. *Rehabilitation.*—After Partition about 8·9 million displaced persons migrated into India, 4·7 million from West Pakistan and the rest from East Pakistan. Their relief and rehabilitation was a major undertaking during the First and Second Plans. Outlay on rehabilitation before the First Plan amounted to about Rs. 71 crores. The total expenditure on rehabilitation under the two Plans amounted to about Rs. 168 crores. Of this about Rs. 71 crores was incurred on housing, Rs. 31 crores on education and vocational training, Rs. 29 crores on rural loans for agricultural purposes and Rs. 11 crores on urban loans for small industries, trade and business and the balance on miscellaneous schemes. A large number of townships and colonies was established by Government for settling displaced persons and over 7 lakhs of residential units were constructed either by Government or by the displaced persons with Government assistance. Development of the Dandakaranya area for the re-settlement of displaced agriculturist families from East Pakistan was also initiated during the Second Plan period.

43. *Employment.*—During the ten years 1951-61, population increased by 77 million. This factor has accentuated the problem of unemployment. The additional employment opportunities created during the Second Plan are estimated at about 8 million, of which 6·5 million were outside agriculture. At the end of the Second Plan, the backlog of unemployment is estimated at about 9 million.

44. From the account given above, it will be seen that over the past ten years, the country has made considerable progress in every branch of national life. Inevitably, it has experienced, at the same time, stresses and strains; these are the growth pains of an economy struggling to find its way out of deep-rooted poverty and the economic stagnation of decades. In every direction new ground has been broken and valuable experience gained. Doubtless, there have been failures and errors that might have been avoided. There are many weaknesses in the economic and social structure that still persist. The country's potential for development is far from being realised. Yet, all these are part of an inspiring period in the nation's history—a story of continuous endeavour reaching into the far corners of the land and drawing within its fold all sections of the people.

CHAPTER IV

APPROACH TO THE THIRD FIVE YEAR PLAN

IN its scope and emphasis, each Five Year Plan embodies an assessment of the current economic and social situation and of the progress of the economy over a period of years and, at the same time, it seeks to relate the next phase of development to the country's basic social objectives and the perspective of long-term economic growth. These latter have been set out in Chapters I and II. In drawing up the Third Plan the principal aims have been the following:

(1) to secure an increase in national income of over 5 per cent per annum, the pattern of investment being designed also to sustain this rate of growth during subsequent Plan periods;

(2) to achieve self-sufficiency in foodgrains and increase agricultural production to meet the requirements of industry and exports;

(3) to expand basic industries like steel, chemicals industries, fuel and power and establish machine-building capacity, so that the requirements of further industrialisation can be met within a period of ten years or so mainly from the country's own resources;

(4) to utilise to the fullest possible extent the manpower resources of the country and to ensure a substantial expansion in employment opportunities; and

(5) to establish progressively greater equality of opportunity and to bring about reduction in disparities in income and wealth and a more even distribution of economic power.

2. The period of the Third Plan represents the first stage of a decade or more of intensive development leading to a self-reliant and self-generating economy. As a result of progress achieved during the First and the Second Plan, the foundations for rapid economic growth have been laid. India's economy is now much larger in size and in the range of its operations and has become both more dynamic and more complex. In all directions there are large and growing demands to be met. Considerable investments have also to be made in projects and programmes whose output will be available only in the course of the Fourth Plan. Thus, the Third Plan will call for the maximum rate of investment that can be achieved.

3. The general pattern of development followed in the Third Plan necessarily flows, in large part, from the basic approach and experience of the Second Plan. However, in some important respects it represents a wider view of the problems of development and calls both for more intensive effort and a greater sense of urgency. In particular, the Third Plan will be directed towards strengthening the agricultural economy, developing industry, power and transport and hastening the process of industrial and technological change, achieving marked progress towards equality of opportunity and the socialist pattern of society, and providing employment for the entire addition to the labour force. Inevitably, a plan of development with these aims will make far reaching demands on the nation. It is essential that the burdens of development during the Third Plan should be equitably distributed and, at each stage, the economic, fiscal and other policies adopted should bring about improvements in the welfare and living standards of the bulk of the people.

4. In the scheme of development during the Third Plan the first priority necessarily belongs to agriculture. Experience in the first two Plans, and especially in the Second, has shown that the rate of growth in agricultural production is one of the main limiting factors in the progress of the Indian economy. Agricultural production has, therefore, to be increased to the largest extent feasible, and adequate resources have to be provided under the Third Plan for realising the agricultural targets. The rural economy has to be diversified and the proportion of the population dependent on agriculture gradually diminished. These are essential aims if the incomes and levels of living of the rural population are to rise steadily and to keep pace with incomes in other sectors. Both in formulating and in implementing programmes for the development of agriculture and the rural economy during the Third Plan, the guiding consideration is that whatever is physically practicable should be made financially possible, and the potential of each area should be developed to the utmost extent possible.

With the establishment of democratic institutions at the district, block and village levels, responsibility and initiative in economic and social development in rural areas will rest increasingly with popular organisations—with Zila Parishads, Panchayat Samitis and Village Panchayats and with cooperatives. In the pattern of rural development, service cooperatives are to be organised on the basis of the village community as the primary unit. Cooperative farming, which is vital for rural progress, is in its essence a logical growth of cooperation and the approach of community development at the village level.

The Third Plan envisages concentrated effort in agriculture on a scale calling for the participation of millions of peasant families of agricultural workers in village production plans and in large scale programmes

of irrigation, soil conservation, dry farming, afforestation and the development of local manurial resources. One of the main aims of the Plan, therefore, is to harness the manpower resources available in rural areas. This is to be achieved through the programmes of development for which the Plan provides, supplemented by extensive rural works programmes for utilising manpower resources in the villages, especially for increasing agricultural production.

5. In the Third Plan, as in the Second, the development of basic industries such as steel, fuel and power and machine-building and chemical industries is fundamental to rapid economic growth. These industries largely determine the pace at which the economy can become self-reliant and self-generating. Programmes for industrial development have been drawn up from the point of view of the needs and priorities of the economy as a whole, the public and the private sectors being considered together. However, while the private sector will have a large contribution to make, the role of the public sector in the development of the economy will become even more dominant. An expanding public sector, engaged specially in developing basic industries and producing large surpluses for development, will itself be one of the most important factors determining the rate at which the economy can grow. Moreover, the Third Plan will carry further the present efforts to build up small industries as a vital segment in the industrial structure by promoting greater integration between large scale and small scale industries, spreading the benefits of industrialisation to small towns and rural areas and introducing improved techniques in the traditional rural industries.

6. Considerable emphasis is being given in the Third Plan to the development of education and other social services. In a scheme of development which relies heavily on public understanding and response and on cooperation and voluntary effort, the significance of these programmes cannot be too greatly stressed. They are essential for ensuring a fair balance between economic and social development and, equally, for realising the economic aims of the Plan. Large technological changes and increases in productivity cannot be achieved without greatly strengthening the educational base of the community and improving living conditions. Some of the programmes included in the Plan for social services are directly linked with economic development, such as scientific research, technical education and the training of craftsmen, family planning, and the provision for housing and urban development. There are others which are indispensable on larger social considerations and, over a period, exert a powerful influence on the pace of economic progress, such as the expansion of facilities for education, control of diseases, development of health and medical services, award of scholarships, supply of drinking water in villages and towns, and the provision of welfare services for the

less developed sections of the community. Within the limits of the resources available, these and other needs are being provided for in the Third Plan. However, it is obvious that in some directions, and more especially in education, in rural water supply and in family planning, as the Plan proceeds, every effort must be made to secure the largest measure of advance possible.

7. As has been explained earlier, until the economy has been strengthened considerably, it is difficult to provide work at an adequate level of remuneration to the entire labour force. A twofold approach has, therefore, to be adopted. In the first place, development programmes included in the Plan have to be worked in such a way as to yield the maximum employment of which they are capable. They have to be implemented in an integrated manner and adapted to the actual requirements of each area. Secondly, in many fields, where manpower can be used more intensively, development programmes under the Plan can be speeded up and enlarged to the extent necessary in the later stages of the Plan. Action along these lines will be required specially in areas with heavy pressure of population and in which there is considerable under-employment. It is at present reckoned that development programmes in the Plan may provide additional employment to the extent of about 14 million as against the increase in the labour force during the Third Plan of about 17 million. The balance is proposed to be taken care of through large-scale rural works programmes, village and small industries and other means.

8. In preparing the Third Plan the requirements of the economy as a whole and in different sectors have been considered carefully. The Plan takes into account the results of development over the past ten years, the increased expectations of the people, the implications of growth in population and of large-scale industrialisation, and the need to mobilise the domestic resources of the country to the greatest extent possible. A plan of smaller dimensions than those envisaged would prove altogether inadequate. For achieving a cumulative rate of growth of over 5 per cent per annum, it will be necessary to undertake net investment to the extent of more than 14 per cent of the national income as compared to the present level of about 11·5 per cent. This involves raising the rate of domestic savings from about 8·5 per cent at present to about 11·5 per cent by the end of the Third Plan. Domestic resources will need to be supplemented in substantial measure by external assistance, primarily to finance the import of vital capital goods which cannot be immediately produced within the country and to provide a measure of support to the balance of payments. Dependence at this stage of development on external resources serves to emphasise the importance of policies and measures for import substitution and for increasing export earnings during the Third Plan.

9. In the scheme of production for the Third Plan care has been taken to provide for adequate supplies of foodgrains and other consumer goods. Nevertheless, it is inevitable that from time to time inflationary pressures may emerge. The Plan, therefore, postulates a price policy which will ensure that the movements of relative prices are in keeping with its priorities and targets and that the prices of essential goods which enter into the consumption of low income groups do not rise unduly. It will also be essential to restrain the consumption of relatively non-essential goods and services. Along with this, in planning the pattern of production, care must be taken to avoid the use of the limited resources available in the production of relatively non-essential goods and services. These measures are important not only for securing rapid development under conditions of economic stability but are also necessary for the mobilisation of the domestic resources and the foreign exchange needed for the successful implementation of the Third Plan. The extent to which the resources required for the Plan can be raised is in no small degree dependent on the manner in which it is implemented, especially the efficiency with which various projects are constructed and operated, the extent to which the available capacities in agriculture, industry, power, transport and elsewhere are utilised, and the intensive use of the country's manpower resources. The financial requirements of the Third Plan as described in the following Chapter are distinctly higher than the estimates of resources at present available. To be able to force the pace of development, there must be a continuing effort to mobilise financial resources on a large scale. Recent studies suggest that in several directions this larger effort is within the range of practical achievement.

10. In the Third Plan stress is being placed on the careful phasing of projects in relation to one another. At each stage in development, there should be a series of projects under execution, ensuring continuity both in planning and in the flow of benefits. Some measure of balance must be preserved between projects with long gestation periods and those which can be completed over relatively short periods. In phasing projects, there has to be strict regard to the requirements of physical planning, especially planning of manpower and the provision of materials and ancillary services including power and transport. In the related sectors of industry, transport and power, during each phase of development, close coordination in planning and execution is essential not only for new projects, but equally, for achieving rising levels of production from the existing plants. The programme of industry, along with power, transport, scientific research and technical education, included in the Third Plan, is conceived of as a continuous and integrated whole. Every effort has, therefore, to be made to initiate and complete within the shortest possible time schemes which will help to raise the potential for growth within the economy. Large projects take considerable periods, but in the early

stages the investments required for them are of relatively small magnitude. By speeding up preparatory work on them, invaluable time can be gained.

11. In the Third Plan, as in the Second, the plans of States have great importance for the rapid development of the national economy. Important national objectives, as in agriculture, education and other social services, and in the utilisation of rural manpower, can be realised only in the measure in which the plans of States are carried out successfully. They bear closely on the welfare of the people as a whole and, to a large extent, it is through them that a rise in the levels of living for the weaker sections of the community and for the less developed areas can be secured. With the development of large scale industries, specially of basic and heavy industries, State plans have to provide on a large scale for the development of power and technical education, for schemes of housing and urban development, and for measures to achieve closer integration of the rural with the industrial economy. In formulating the plans of States under the Third Plan and determining their size and patterns, to the extent possible, these considerations have been kept in view.

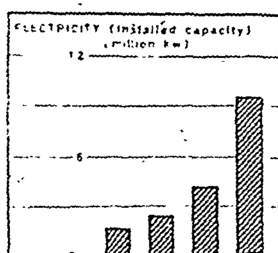
12. To a greater extent than in the past, during the Third Plan, the direction and management of the Indian economy will call for improved methods and machinery for planning and execution, better statistical and economic intelligence, greater appreciation of technological and other developments occurring in different fields, fuller knowledge of the country's potential resources and, generally, for more systematic analysis and research. For every large programme and every major project or group of allied projects, there is need for careful evaluation of progress. This is being provided for under the Third Plan. Along with it, over a wide area, improvements in statistical data must be secured, notably in the estimation of national income and of capital formation, in the statistics of agricultural and industrial production, distribution and employment, in vital statistics, and in the collection and study of data relating to consumer expenditure, costs of living and the distribution of income.

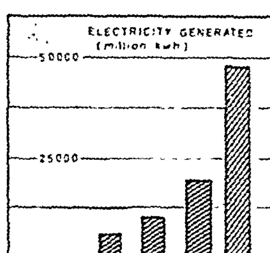
13. The programme of economic and social studies undertaken during the first two Plans, the results of which are now becoming available, was devoted in the main to investigations of conditions of migration and employment in cities, studies of land reform and farm management, surveys of cottage and small scale industries and evaluation of irrigation benefits. and to selected problems of social welfare and administration. To a limited extent, analytical studies on the broader aspects of the economy were also taken in hand. In the programme of research for the Third Plan, to be undertaken through universities and leading research institutions as well as by the Planning Commission and other agencies, a great deal of attention will need to be given to problems such as efficiency of investment in different sectors of the economy, pricing policies

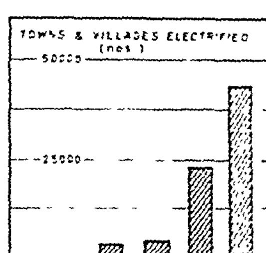
and techniques, foreign trade and the balance of payments, problems of organisation and administration in relation to planned development, problems of social change and social conflict, studies bearing on regional and urban development, and investigations into the working of programmes for land reform, cooperation, community development, rural electrification, small scale industries and others. Many of these studies will be of considerable value in the preparation of plans for long-term development. They will also greatly facilitate the realisation of the specific aims of the Third Plan and provide useful criteria for evaluating performance and sifting the lessons to be drawn from experience in different parts of the country.

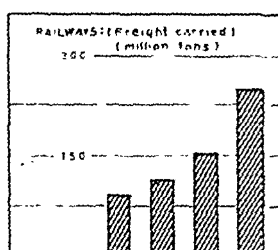
14. In the course of the Third Plan, the nation sets out to achieve as much in five years as has been realised in the ten years of the First and the Second Plan. The task is large in magnitude, urgent, and of great significance for the present and the future. Its administrative implications are vast and call for the highest standards of efficiency attainable in every field of activity. Effective implementation requires the maximum mobilisation of resources, adaptation to changing needs, co-ordination and concentration of resources at every vital point, ability to anticipate difficulties and problems, readiness to seize upon favourable opportunities for growth and, above all, men of skill and knowledge and organisations attuned to the objectives of the Plan. A plan of development, however elaborate or precise, is at best a framework which sets broad patterns for action, for participation in the national endeavour, on the part of millions of people living and working under conditions of marked diversity. Its success rests on a variety of factors—on widespread understanding of the challenge and the burdens of development, on the release of new productive forces and increasing application of modern science and technology, on changes in outlook and motivation and, finally, on a climate of confidence that rapid economic development is the means both to social justice and to wider economic opportunity. These are among the principal conditions for achieving fully the advance envisaged in the Third Five Year Plan.

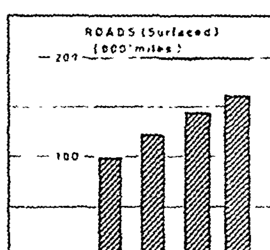
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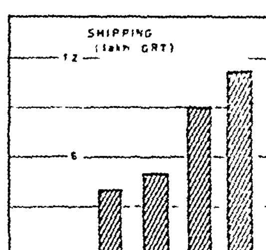


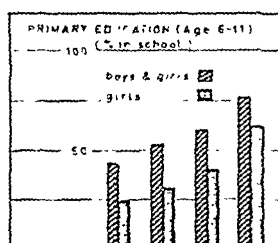


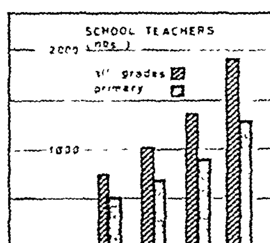


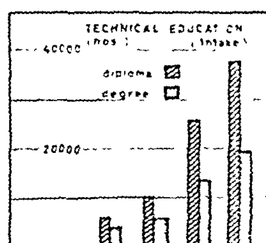


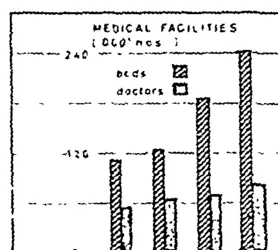


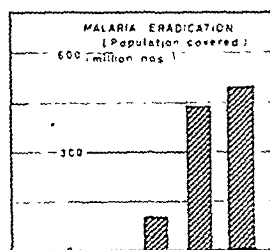


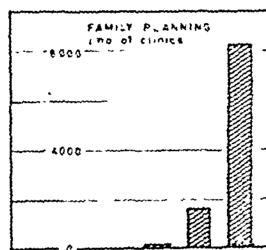


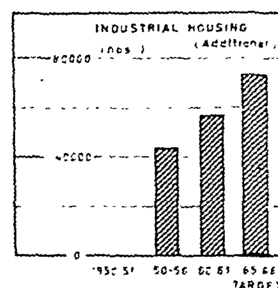


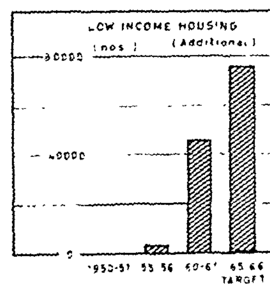


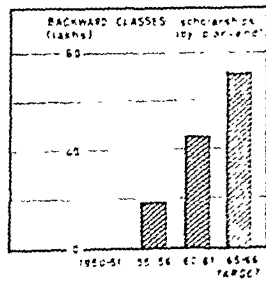




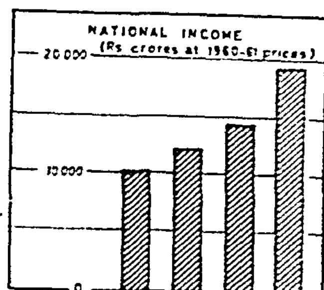


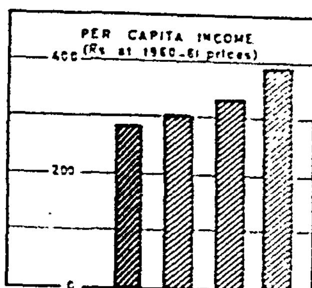


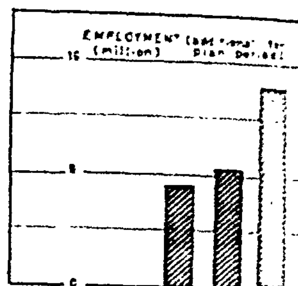


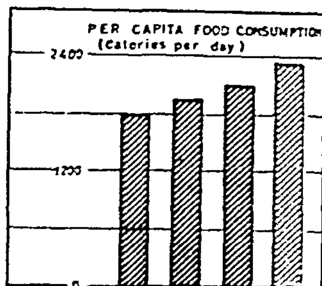


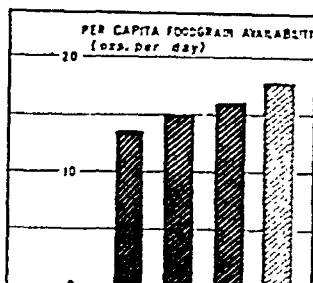
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THIRD PLAN TARGETS

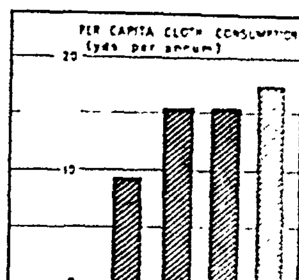


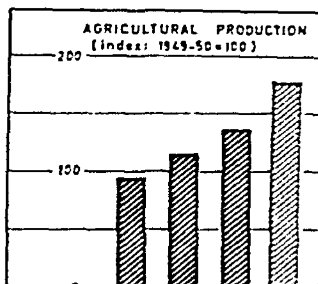


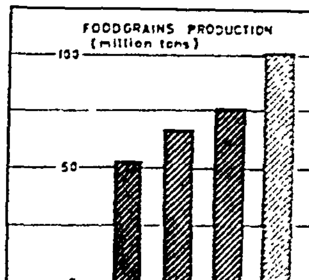


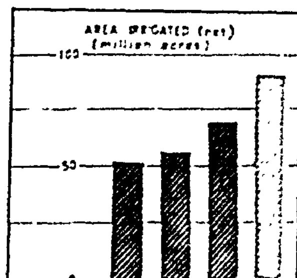


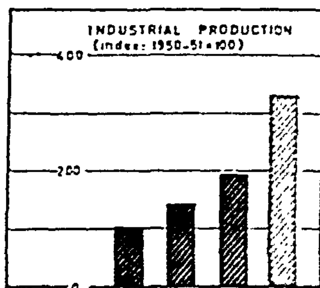


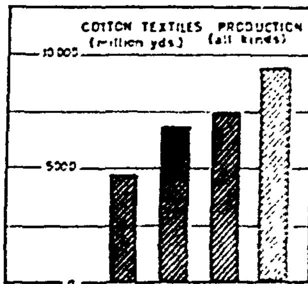


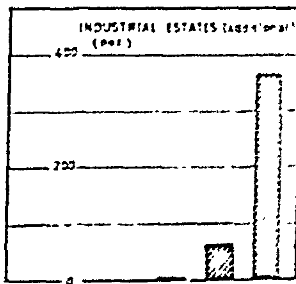


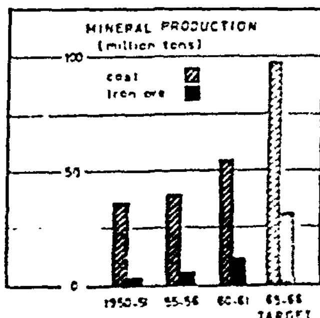


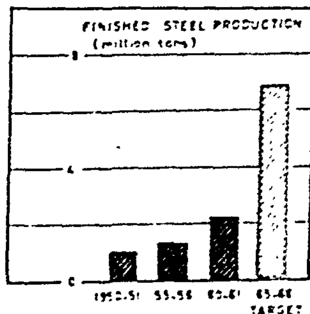


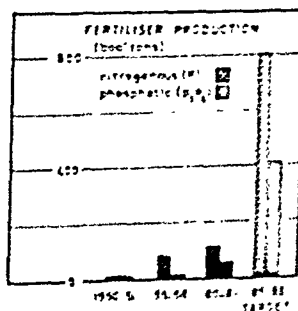












CHAPTER V

THE THIRD PLAN IN OUTLINE

PHYSICAL TARGETS

THE principal aims of the Third Five Year Plan have been set out in the preceding Chapter. If these aims are to be achieved, it is essential that a certain minimum development should take place in different sectors of the economy during the next five-year period. The physical targets of the Third Plan have been formulated keeping these minimum needs in view. A detailed list of these targets is given in Annexure I to this Chapter. It is estimated that national income should go up by about 30 per cent and per capita income by about 17 per cent over the next five years. A few selected targets are included in the Table below with the object of giving a synoptic view of the Plan:

Table 1: Selected targets

item	unit	1960-61	1965-66	percentage increase in 1965-66 over 1960-61
index number of agricultural production	1949-50=100	135	176	30
foodgrains production	million tons	76	100	32
nitrogenous fertilisers consumed	000 tons of N	230	1000	335
area irrigated (net total)	million acres	70	90	29
cooperative movement:				
advances to farmers	Rs. crores	200	530	165
index number of industrial production	1950-51 = 100	194	329	70
production of:				
steel ingots	million tons	3·5	9·2	163
aluminium	000 tons	18·5	80	332
machine tools (graded)	value in Rs. crores	5·5	30·0	445
sulphuric acid	000 tons	363	1500	313
petroleum products	million tons	5·7	9·9	70
cloth				
mill-made	million yards	5127	5800	13
handloom, powerloom and khadi	million yards	2349	3500	49
total	million yards	7476	9300	24

item	unit	1960-61	1965-66	percentage increase in 1965-66 over 1960-61
minerals:				
iron ore	million tons	10·7	30·0	180
coal	million tons	54·6	97·0	76
exports	Rs. crores	645	850	32
power: installed capacity	million kW	5·7	12·7	123
railways: freight carried	million tons	154	245	59
road transport: commercial vehicles on road	000 numbers	210	365	74
shipping: tonnage	lakh GRT	9·0	10·9	21
general education:				
students in schools	million numbers	43·5	63·9	47
technical education:				
engineering and technology—degree level intake	000 numbers	13·9	19·1	37
health:				
hospital beds	000 numbers	186	240	29
doctors practising	000 numbers	70	81	16
consumption levels:				
food	calories per capita per day	2100	2300	10
cloth	yards per capita per annum	15·5	17·2	11

PHYSICAL PROGRAMMES

2. The increase in population, the growing expectations of the people and the urgent need for attaining the stage of self-sustained growth over the next two or three Plan periods make it essential that there should be every possible effort to achieve these targets during the next five years. In addition, certain measures must be taken during the Third Plan period itself in preparation for the Fourth Plan. The physical programmes included in the Third Plan have been formulated with both these objectives in view. The total cost of completing all these programmes exceeds Rs. 8000 crores for the public sector, and is estimated at Rs. 4100 crores* for the private sector.

3. It is important that programmes for industrial development, including power, transport, technical education and scientific research, should proceed in a connected manner in accordance with an approved scheme of priorities so that, as the requisite foreign exchange and personnel become available, corresponding internal resources are also found and rapid progress is assured. In fields like agriculture, small industries and social services, where there is scope for attracting a great

*This excludes the estimated transfer of Rs. 200 crores from the public to the private sector.

deal of local community effort and public participation and where imported supplies are not a limiting factor, the effort has to be related to the maximum physical capacity for implementation and should not fall below the minimum needs of the country. In fact, as the productive projects in the industrial and agricultural sectors are implemented and additional output becomes available, it should be possible to raise additional resources for expanding the scope of some of the projects which have large employment potential but do not require much foreign exchange outlay.

4. These considerations suggest that the physical programmes to be accepted for implementation over the five-year period should not be altogether limited by the financial resources immediately in sight at the stage of drawing up the Plan, although the outlays have necessarily to be regulated with reference to the resources actually mobilised from year to year. Past experience has shown that if a Plan for a five-year period is prepared only in terms of the financial resources in sight at the time of the preparation of the Plan, the fullest use cannot be made of all the opportunities which present themselves in the course of the implementation of the Plan.

Financial Provisions

5. The estimate of financial resources has been placed for the present at Rs. 7500 crores. Recent studies, however, indicate that there are possibilities of raising additional resources if certain measures are taken for mobilising the savings of the country. In fact, to the extent that the physical targets included in the Plan are achieved, the prospects of raising additional financial resources will correspondingly improve. As a result of the support which India's development plans are receiving from friendly countries and from the International Bank of Reconstruction and Development and other international agencies, there is reason to hope that the shortage of foreign exchange may not be a major impediment in the realisation of the goals of the Third Plan. On the other hand, as the Plan proceeds, it may be found that some of the projects approved for implementation may not be completed within the Third Plan period, and a part of the investment may in fact be deferred to the early phase of the Fourth Plan. A considerable proportion of the projects, especially in industry and mining, have relatively long gestation periods and frequently involve difficult technical problems. Delays in designing and setting up industrial plants or undertaking complementary development or in securing equipment and components may well extend the priod of completion of some of these projects beyond the Third Plan. Whatever the consequential adjustments, special care would, however, be taken to ensure that projects which are essential for achieving the key targets included in the Third Plan are completed in time.

6. The following Table gives the distribution of the financial outlay of Rs. 7500 crores under major heads:

Table 2: Financial provisions

(Rs. crores)

head	Second Plan		Third Plan—financial provisions				
	total expenditure	percentage	States	Union Territories	Centre	total	percentage
agriculture and community development	530	11	919	24	125	1068	14
major and medium irrigation . . .	420	9	630	2	18	650	9
power	445	10	880	23	109	1012	13
village and small industries . .	175	4	137	4	123	264	4
organised industry and minerals .	900	20	70	neg	1450	1520	20
transport and communications .	1300	28	226	35	1225	1486	20
social services and miscellaneous .	830	18	863	87	350	1300	17
inventories .	—	—	—	—	200	200	3
total	4600	100	3725@	175	3600	7500	100

Out of the total financial outlay of Rs. 7500 crores in the public sector, investment* is estimated at Rs. 6300 crores and current outlay,** representing expenditure on staff, subsidies, etc. at Rs. 1200 crores. These figures include only that part of the expenditure on development programmes of local bodies like municipalities, panchayats, etc. as is financed by Central and State Governments as part of their Plan expenditure. They do not include the contributions which these local bodies make out of their own resources. Similarly they do not include the contributions in cash or in kind which are made by the local people in projects of a local character involving local participation. Expenditure on development services and institutions established upto the end of the Second Plan, estimated at about Rs. 3000 crores for the five-year period, falls outside the Third Plan outlays shown in Table 2.

7. In the Table above, the financial provision for the States is shown as Rs. 3725 crores. As against this the total cost of the physical programmes included in State plans amounts to Rs. 3847 crores. The revenues of States have, however, recently shown marked improvement. It is considered that given the necessary additional taxation, States should find

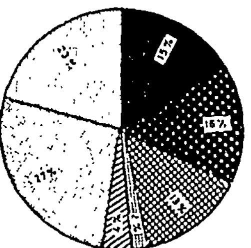
@ This is subject to the observation made in the following paragraph and paragraph 27 of Chapter VI.

*Investment is expenditure on the creation of physical assets (e.g. buildings, plant and equipment), including expenditure on personnel required for putting up these assets. The expression corresponds broadly to expenditure on capital account.

**Current outlay corresponds broadly to expenditure on revenue account on Plan schemes; it is expenditure other than that classified as 'investment'.

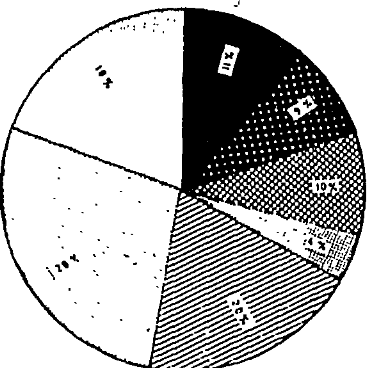
DISTRIBUTION OF PLAN OUTLAYS IN THE PUBLIC SECTOR

FIRST PLAN



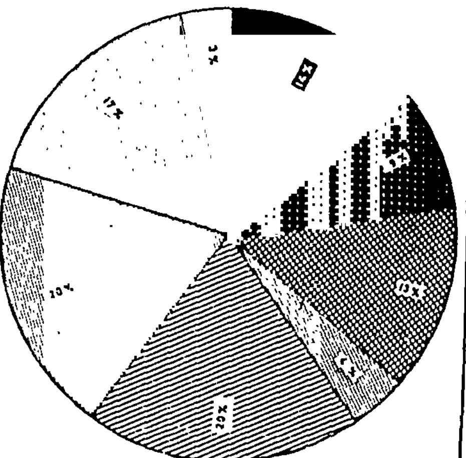
Rs. 1960 crores

SECOND PLAN



Rs. 4600 crores

THIRD PLAN



Rs. 7500 crores

	FIRST PLAN	SECOND PLAN	THIRD PLAN	
	Rs.	crores		
(black)	291	529	1068	AGRICULTURE & COMMUNITY DEVELOPMENT
(dots)	310	420	650	IRRIGATION
(cross-hatch)	260	445	1012	POWER
(vertical shading)	43	176	264	VILLAGE & SMALL INDUSTRIES
(diagonal lines)	74	900	1520	INDUSTRY & MINERALS
(white)	523	1300	1486	TRANSPORT & COMMUNICATIONS
(light stipple)	459	30	1300	SOCIAL SERVICES & MISCELLANEOUS
(blank)			200	INVENTORIES

it possible to finance fully the physical programmes included in their plans. Thus the gap between physical programmes and financial resources, *such as it may be, relates mainly to the Centre.* In the programmes of the Central Government those dependent on external resources constitute a large proportion, for instance, industries, minerals, transport and communications. As foreign exchange becomes available, necessary steps will have to be taken to raise the requisite rupee resources.

8. As has been mentioned earlier, the Plan includes outlays not only by the public sector but also by the private sector. Investment by the private sector is estimated at Rs. 4100 crores. The break-up of the public and the private sector investment under major Plan heads is given below:

Table 3: Investment in Second and Third Plans

(Rs. crores)

head	Second Plan				Third Plan			
	public	private	total	percentage	public	private	total	percentage
agriculture and community development	210	625	835	12	660	800	1460	14
major and medium irrigation	420	*	420	6	650	*	650	6
power	445	40	485	7	1012	50	1062	10
village and small industries	90	175	265	4	150	275	425	4
organised industry and minerals	870	675	1545	23	1520	1050	2570	25
transport and communications	1275	135	1410	21	1486	250	1736	17
social services and miscellaneous	340	950	1290	19	622	1075	1697	16
inventories	—	500	500	8	200	600	800	8
total	3650	3100†	6750	100	6300	4100†	10400	100

9. The foreign exchange requirement for an investment of Rs. 10,400 crores is estimated to be over Rs. 2030 crores. The level of investment, public and private, is expected to rise from about Rs. 1600 crores in the last year of the Second Plan to about Rs. 2600 crores at the end of the Third. Corresponding figures for the public sector alone are Rs. 800 crores and Rs. 1700 crores.

10. It will be seen from Table 3 that the Third Plan provides for an increase of about 54 per cent in total investment—70 per cent in public sector investment and 32 per cent in private sector investment.

*Included under agriculture and community development.

†Excludes transfers from public to private sector.

The proportion of the public sector will be, however, higher to the extent that the public sector outlay is raised above the financial provision of Rs. 7500 crores, near to the physical Plan of over Rs. 8000 crores.

STATE PLANS

11. Out of the programmes included in the public sector of the Third Plan the plans of States account for Rs. 3847 crores and of Union Territories for Rs. 175 crores. The remaining programmes fall within the plans of the Central Ministries. Details have been given in Annexure II to this Chapter. Provisions in the States and at the Centre have been made on the principle that generally development schemes to be implemented by State Governments should form part of the State plans and only certain limited categories of schemes should be shown in the plans of Central Ministries as being 'sponsored' by the Central Government. In this way, an attempt has been made to broaden further the scope of the plans of States and facilitate the integrated working of their development programmes.

12. In determining the plan of each State consideration was given to its needs, problems, past progress and lags in development, likely contribution to the achievement of the major national targets, potential for growth and the contribution in resources which the State could make towards its development programmes. In assessing needs and problems, such factors as population, area, levels of income and expenditure, availability of certain services, e.g. roads, schools, hospitals, extent of commitments carried over from the Second Plan, commitments on account of large projects or special programmes and the state of technical and administrative services available were taken into account. Care was also taken to see that States whose resources were unavoidably small did not have to limit development to a scale which was altogether insufficient, merely because of paucity of resources. At the same time States which were able to make a larger effort in mobilising their own resources could undertake development on an appropriate scale. The break-up of Rs. 4022 crores, which is the total of all programmes included in the plans of States and Union Territories, together with comparable figures for the First and Second Plans is given Statewise in Annexure III to this Chapter. A detailed break-up by States and by heads of developments is given in Appendix B at the end of the Report.

13. The broad indications of the physical programmes and the financial provisions as indicated above give a measure of the overall effort and the relative emphasis on different sectors envisaged in the Plan. Within this general framework the Plan comprises a number of concrete programmes of development, details of which have been given in the

STATES: PLAN OUTLAYS

(RS. CRORES)

THIRD PLAN

450
400
350
300
250
200
150
100
50
0

SECOND PLAN

200
150
100
50
0

FIRST PLAN

150
100
50
0

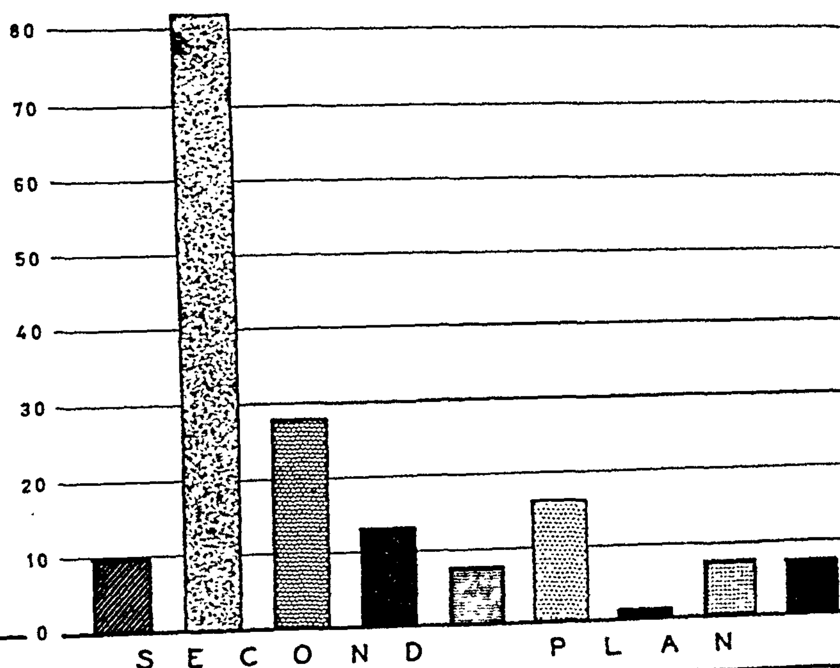
ANDHRA PRADESH
ASSAM
BIHAR
GUJARAT
JAMMU AND KASHMIR
KERALA
MADHYA PRADESH
MADRAS
MAHARASHTRA
MYSORE
ORISSA
PUNJAB
RAJASTHAN
UTTAR PRADESH
WEST BENGAL

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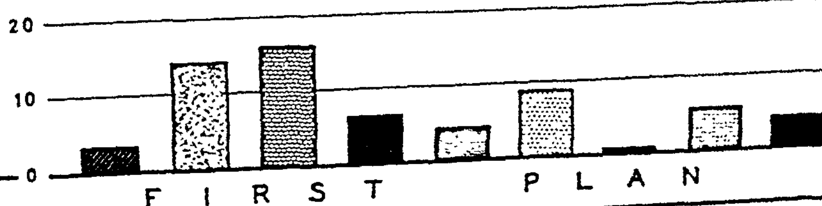
UNION TERRITORIES: PLAN OUTLAYS

(RS. CRORES)

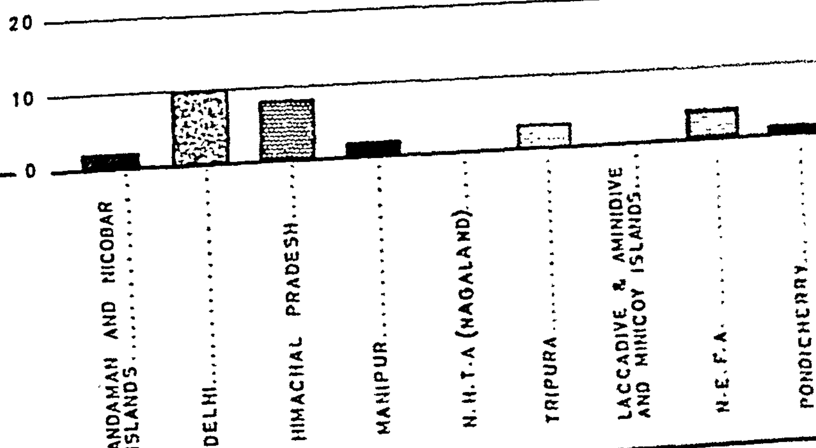
THIRD PLAN



SECOND PLAN



FIRST PLAN



subsequent Chapters of this Report. A brief account of these programmes is, however, given in the following paragraphs.

AGRICULTURE

14. Programmes for agriculture, irrigation and community development included in the Third Plan entail a total outlay of Rs. 1718 crores as compared to estimated expenditure of Rs. 950 crores in the Second Plan. These programmes aim at nearly doubling the rate of growth of agricultural production over the next five years. Production of foodgrains is expected to rise by 30 per cent and of other crops by 31 per cent as shown in the following Table:

Table 4: Index number of agricultural production

(1949-50=100)

group	1960-61	1965-66	percentage increase in 1965-66 over 1960-61
all crops	135	176	30
foodgrains	132	171	30
other crops	142	186	31

15. To achieve this high rate of growth, intensive efforts are to be made in several directions. First, a large programme of irrigation, comprising major, medium and minor irrigation schemes, is to be undertaken. This will extend irrigation to about 20 million acres, raising the net irrigated area to about 90 million acres. Second, dry farming techniques are to be introduced on about 22 million acres and soil conservation measures over an area of about 11 million acres. Third, the consumption of fertilisers is to be stepped up—a fivefold increase being aimed at in nitrogenous fertilisers from 230,000 tons (in terms of N) to one million tons, and a sixfold increase in phosphatic fertilisers from 70,000 tons (in terms of P_2O_5) to 400,000 tons. The area under green manures is to be increased from 11·8 million acres to 41 million acres. Plant protection measures are to be undertaken over an additional area of 50 million acres. Fourth, special efforts will be made to introduce modern technology in rural areas through a large-scale programme for improved agricultural implements and machines. A comprehensive programme for agricultural implements has been prepared which includes establishment in every State of one centre for testing, designing, technical guidance and manufacturing implements of improved type; adequate arrangements for the supply of iron and steel to manufacturers; credit for supply, purchase and production of improved implements; and strengthening of agricultural engineering personnel in the States. Fifth,

the community development programme will be extended to the entire rural area by October, 1963, thus bringing technical assistance and supplies within the reach of all the farmers in the country. All villages will be served by panchayats and cooperatives. Through the introduction of democratic institutions at the district and block levels, responsibility and initiative for development are being transferred to the people of each area. Membership in service cooperatives is expected to increase to about 37 millions, that is about two-thirds of all agricultural families. Considerable expansion of cooperative credit is aimed at, the targets being about Rs. 530 crores of short and medium-term advances and Rs. 150 crores (loans outstanding) of long-term credit. The number of cooperative marketing societies will be increased from 1869 to 2170. Nearly 980 new storage godowns at mandi centres will be set up and 9200 smaller godowns will be established in the rural areas on a cooperative basis. Twenty five new cooperative sugar factories will be set up and greater attention will be paid to the establishment of cooperative processing units for rice, cotton, jute, groundnut, fruits, etc. There is also a programme for setting up 2200 primary consumers' stores and 50 wholesale stores on a cooperative basis. Efforts will be continued to popularise cooperative farming and 3200 cooperative farms will be organised as pilot experiments throughout the country. Sixth, selected districts which have particularly favourable irrigation facilities and assured rainfall will be put under an intensive agricultural development programme for stepping up agricultural production. To begin with, one such district has been selected in every State. This important new programme will bring to these areas a concentration of technical help, fertilisers, improved credit and other supplies to reach all farmers through village panchayats and cooperatives and help increase both production and marketable surplus of foodgrains substantially.

16. It is expected that as a result of these various measures the production of the major crops will go up as shown in the following Table:

Table 5: Production of major crops

crop	unit	1960-61	1965-66	percentage increase in 1965-66 over 1960-61
foodgrains	million tons	76·0	100·0	32
oilseeds	million tons	7·1	9·8	38
sugarcane* . . .	million tons	8·0	10·0	25
cotton	million bales	5·1	7·0	37
jute	million bales	4·0	6·2@	55

*In terms of raw sugar or gur.

@Excludes mesta which may provide 1·3 million bales in 1965-66.

A substantial part of this increase is expected to be achieved through an improvement in the yield per acre. It is expected for example, that the average yield of rice during the Third Plan period will be 1030 lb per acre as compared to 807 lb in the Second Plan period.

17. With the achievement of these targets, the economy will become self-sufficient in the supply of foodgrains and per capita availability will go up from 16 oz per day in 1960-61 to 17·5 oz per day in 1965-66. The per capita consumption of cloth per annum will go up from 15·5 yards in 1960-61 to 17·2 yards in 1965-66. Production of subsidiary foods like fruits and vegetables, for which there is a growing demand in the country, will be given special emphasis and an attempt will be made to provide a more balanced diet than at present. Special measures will be taken to step up the production of commodities like tea, coffee, rubber, coconut, arecanut, tobacco, pepper, cardamom and lac, which are important for either earning or saving foreign exchange.

18. Large programmes for the improvement of animal husbandry, dairying, fisheries and forestry have also been included in the Third Plan. Of the key village blocks already established under the programme for intensive development of cattle, 55 will be expanded and 38 new blocks will be set up in important breeding tracts. The number of veterinary hospitals and dispensaries will be raised from 4000 to 8000 and the programme for eradication of rinderpest already initiated will be completed. The production of wool will be stepped up from 72 million lb to 90 million lb. The production of milk will be increased from 22 million tons to 25 million tons. New milk supply schemes will be taken up in 55 cities with a population exceeding one lakh each, 8 rural creameries, 4 milk product factories and 2 cheese factories will be set up. The production of fish will be stepped up from 1·4 million tons to 1·8 million tons; 4000 fishing boats will be mechanised and 35 large vessels will be added to the country's fishing fleet. Special emphasis will be given to the development of forestry—700,000 acres afforested with economic species, 600,000 acres of degraded forests rehabilitated and 1,200,000 acres developed as village forests. A countrywide pre-investment survey will be initiated with a view to assessing the potential for the development of large-scale timber and pulp-based industries.

INDUSTRIES

19. Of basic importance in the Third Plan is the programme for the expansion of industries, especially capital and producer goods industries with special emphasis on machine-building and development of managerial skill, technical know-how and designing capacity. In this programme the public sector has been assigned a key role, but the

private sector is also expected to have an important part to play within the framework of the Plan. The share of the public sector in the net output of organised manufacturing industries is expected to increase from less than one-tenth in 1960-61 to about one-fourth in 1965-66, and the bulk of this will comprise capital and producer goods. For the development of industries and minerals, the Plan includes a programme costing Rs. 1882 crores but makes for the present a financial provision of Rs. 1520 crores in the public sector. In addition, the private sector is expected to provide about Rs. 1050 crores. The private sector is also expected to provide about Rs. 150 crores to meet the arrears of replacement and modernisation in certain pre-war industries.

20. The emphasis throughout the Third Plan is on the development of those industries which will help to make the economy self-sustaining, such as steel, machine-building and the manufacture of producer goods, and reduce as rapidly as possible the need for external assistance to purchase these goods and also permit a broadening of the export base. The production of consumer goods will also be expanded substantially, mainly in the private sector. It is expected that as a result of all these developments, industrial production will rise by nearly 70 per cent, but even more significant than this increase will be the development in the fields of iron and steel, machinery and chemicals, some idea of which may be obtained from the following Table:

Table 6: Index number of industrial production*

(1950-51=100)

group	1960-61	1965-66	percentage increase in 1965-66 over 1960-61
general index	194	329	70
cotton textiles	133	157	18
iron and steel	238	637	168
machinery (all types)	503	1224	143
chemicals	288	720	150

As has been mentioned earlier this index does not include a large number of new industries and is being revised.

21. The major industrial projects in the public sector included in the Third Plan are in the fields of metallurgy, industrial machinery, machine tools, fertilisers, basic chemicals and intermediates, essential drugs and petroleum refining. Overall capacity targets proposed under the iron and steel industry comprise 10·2 million tons of steel ingots and

*This index is the same as the official index except that the comparison base has been changed from the calendar year 1951 to the financial year 1950-51 so as to facilitate measurement of growth over the Plan periods.

1·5 million tons of pig iron. These will be achieved by expanding the public sector steel plants at Rourkela, Bhilai and Durgapur to a target capacity of 5·9 million tons and also by setting up a fourth steel plant at Bokaro. There will be some expansion of capacity for steel in the private sector mainly through the installation of scrap-based electric furnaces which will augment the supplies of billets to re-rollers. About 200,000 tons of pig iron is also expected to be produced from low shaft furnaces proposed to be established on a decentralised basis in the private sector. The manufacture of tool, alloy and stainless steels has been given a high priority in the Third Plan and it is expected that a total production of 200,000 tons will be achieved by 1965-66. In the field of non-ferrous metals, the Plan aims at achieving a production target of 80,000 tons of aluminium and setting up the first zinc smelting plant in the country with a capacity of 15,000 tons. The production of copper is expected to increase from 8900 tons to 20,000 tons.

22. The most significant development during the Third Plan period will, however, be the rapid growth of machine-building and engineering industries. Foundry/forge capacity, which is crucial for machine-building purposes, will be established on a large scale in the public sector during the Third Plan. The heavy machinery plant being set up near Ranchi, on its expansion to a capacity of 80,000 tons of output per year, will be able to supply a large part of the equipment required for setting up a million-ton steel-making capacity every year. Three heavy electrical equipment projects are designed to ensure, from domestic resources, a wide range of electrical equipment sufficient to enable power generation to be increased at an annual rate of two million kW per year from 1971 onwards. In the field of machine tools, provision has been made for the expansion of the existing machine tool plants and the establishment of two new plants in the public sector. Substantial expansion in the production of machine tools in the private sector is also expected and the target for machine tools production has been put at Rs. 30 crores. The target for the automobile industry has been placed at 30,000 passenger cars and 60,000 commercial vehicles.

23. Production of inorganic fertilisers in terms of nitrogen will be stepped up from about 110,000 tons to 800,000 tons. A substantial increase in the production of phosphatic fertilisers is also proposed. A production target of 1·5 million tons has been set for sulphuric acid and of 340,000 tons for caustic soda. Provision has also been made for increasing the production of organic chemicals, plastics, dyestuffs and drugs. The target of production for cement has been fixed at 13 million tons and that of capacity for refining crude oil at about 11 million tons. Other important projects included in the Third Plan are the synthetic drugs project at Sanatnagar, antibiotics plant near Rishikesh and phyto-chemical project in Kerala. In the sphere of consumer goods industries,

production of cloth by the handloom, powerloom and khadi industries is expected to increase from about 2350 million yards in 1960-61 to 3500 million yards in 1965-66 and of raw silk from 3·6 million lb to 5 million lb. Programmes for coir and handicrafts will be consolidated and enlarged.

Power

28. Power being the basis for the development of industries, both large and small, a high priority has been given to production of power in the Third Plan. The programmes for power development both for public and private sectors total Rs. 1089 crores. By the end of the Third Plan, generating capacity, including plants already commissioned and those under erection and testing, is expected to be of the order of 13·4 million kW, of which 12·7 million kW is expected to be in commercial operation as against 5·7 million kW at the end of the Second Plan. It is estimated that 45,000 million kWh of power will be generated during 1965-66 as against 19,850 million kWh during 1960-61. Transmission lines will be extended from 84,000 circuit miles in 1960-61 to 150,000 circuit miles in 1965-66. The number of towns and villages electrified will be increased from 23,000 in 1960-61 to 43,000 by 1965-66. It is expected that practically all towns and villages with population exceeding 5000 and half of those with population between 2000 and 5000 will receive the benefits of electricity. A nuclear power station of 0·3 million kW capacity will be set up to provide 0·15 million kW during the Third Plan period and the balance in the first year of the Fourth Plan. But bulk of the installed generating capacity aggregating to 7·4 million kW will be provided by the thermal plants and 5·1 million kW by hydro plants.

Transport and Communications

29. The experience of the past few years has underlined the key rôle of transport and communications in economic development. The programmes under this head total Rs. 1655 crores while the financial provision is Rs. 1486 crores for the present. Although large investments were made in this sector under the previous two Plans, the Third Plan includes a substantial programme for its further development. The railway development programme has been formulated on the basis of an estimated increase of freight traffic from 154 million tons in 1960-61 to 245 million tons in 1965-66. Nearly 90 per cent of this additional traffic is expected to be on account of iron and steel, ores, coal, cement and railway materials. Provision has been made for, among others, the construction of 1200 miles of new lines, doubling of 1600 miles of single tracks and manufacturing of diesel and electric locomotives and certain other items, which are still being imported. The road programmes provide for the addition of about

25,000 miles of surfaced roads and also for improvement of the existing road systems, such as providing bridges and missing links and upgrading the existing roads. The road transport programme will be largely in the private sector. The number of commercial vehicles on road is expected to increase from 2·10 lakhs in 1960-61 to 3·65 lakhs in 1965-66. The freight traffic by road is expected to increase by 120 per cent over the next five years. The Plan also includes programmes for development of major and minor ports and for expansion of shipping, inland water transport, civil air transport, posts and telegraphs and broadcasting services. An idea of the important targets in the field of transport and communications included in the Third Plan may be obtained from the following Table:

Table 8: Transport and communications

item	unit	1960-61	1965-66
railways:			
new lines	miles	800*	1200*
new double lines	miles	1300*	1600*
freight carried	million tons	154	245
roads and road transport:			
surfaced roads including national highways	000 miles	144	169
vehicles on road:			
commercial	000 numbers	210	365
passenger	000 numbers	50	80
goods	000 numbers	160	285
shipping:			
tonnage	lakh GRT	9·0	10·9
ports:			
major ports—capacity	million tons	37	49
communications:			
post offices	000 numbers	77	94
telegraph offices	000 numbers	6·5	8·5
telephone connections	000 numbers	460	660

SOCIAL SERVICES

30. *Scientific research*.—Scientific research, especially in fields having a close bearing on industrial and agricultural development, will be given special stimulus. New institutions for research in fields like petroleum technology and for the development and production of scientific instruments will be set up. Problems of utilisation and disposal of industrial and agricultural wastes will be given further attention during the Third Plan period. Provision will also be made for expanding facilities for

*Relates to five-year period ending in the year mentioned.

basic research in universities and technical institutions. The valuable work done towards the use of nuclear energy for the production of electrical power and the use of isotopes, in agriculture, biology, industry and medicine, will be strengthened and further expanded. The production section of the Electronics Division of the Atomic Energy Establishment is expected to fabricate instruments of the value of Rs. 8 crores during the Third Plan period. A major effort will be concentrated on the design and development of prototype nuclear power stations related to Indian conditions and the availability of local materials, so that during the Fourth Plan period the country will be entirely independent of foreign consultancy in the design and construction of large nuclear power stations. The possession of the world's largest deposits of thorium in high grade ore requires that research and development work should also be concentrated on the long range objective of developing thorium as a fuel for power generation.

31. *Technical education and training.*—Technical education is very closely associated with the programme of industrial and agricultural development of the country. It is estimated that the Third Plan will require a total of 151,000 trained engineers and the Fourth Plan as many as 200,000. There will be need also for about 810,000 skilled workers in engineering trades and about 460,000 in non-engineering trades during the Third Plan period. The requirement will be much larger during the Fourth Plan period. To meet this demand the intake capacity of engineering colleges will be increased from 13,860 to 19,140 and of polytechnics from 25,570 to 37,390. Part-time and correspondence courses in engineering and technology will be also introduced. The number of training institutions for craftsmen will be increased to 318 by 1965-66 and in-plant training and evening classes for employed industrial workers will be arranged. In order to provide the requisite number of instructors for skilled workers and craftsmen, the capacity of the four existing central training institutes will be doubled and three new institutes will be set up. The total out-turn of teachers from these institutes is expected to rise to about 8000. The intake capacity of agricultural colleges will be increased from 4600 to 6200 and of veterinary colleges from 1300 to 1460.

In addition to the engineering and technical personnel mentioned above, other categories of personnel required in large numbers include scientists, teachers, statisticians, administrators, managers and personnel for community development and cooperation and for programmes of social welfare and backward classes. For teachers of all categories and particularly for science teachers, where shortages have been felt during the Second Plan, more training facilities have been provided. About 59,000 additional personnel have to be trained in the Third Plan as

Block Development Officers; Extension Officers in agriculture, animal husbandry, industry, cooperation and panchayats; overseers; Social Education Organisers; Gram Sevaks and Gram Sevikas; etc. In the field of cooperation, the additional requirements of senior, intermediate and junior categories of personnel will be nearly 14,000. To work out the various programmes of welfare relating to women, children and the handicapped about 3000 workers and supervisors will be required. Voluntary organisations in the field of social welfare will require about 5000 trained personnel. For welfare of backward classes, the requirement of Block Development Officers, Extension Officers, Gram Sevaks, medical personnel and other staff will be over 14,000. A large number of statisticians will be required in the Third and Fourth Plans and they will be trained in the universities and other specialised institutions like the Indian Statistical Institute and the Institute of Agricultural Research Statistics. A large number of administrative and managerial personnel for industrial enterprises will also be required and training facilities for them will be provided in the institutions already established in the Second Plan and the new institutes of management to be established at Calcutta and Ahmedabad and the National Institute for Training in Industrial Engineering at Bombay.

32. *General education.*—The Third Plan envisages expansion of education facilities at all levels, but the outstanding feature of the Plan is the introduction of free and compulsory primary education in the country for the age group 6 to 11 years. Allowing for slower progress in the education of girls in certain backward areas, it is estimated that the proportion of pupils to the number of children will go up from 61·1 per cent to 76·4 per cent in the age group 6-11, from 22·8 per cent to 28·6 per cent in the age group 11-14 and 11·5 per cent to 15·6 per cent in the age group 14-17 during the Third Plan period. The total number of students in schools will go up from 43·5 million in 1960-61 to 63·9 million in 1965-66. The requirement of school teachers for the Third Plan has been assessed at 5·51 lakhs. Teachers' training facilities are, therefore, proposed to be expanded substantially. The number of students in universities is expected to go up from 9 lakhs in 1960-61 to 13 lakhs in 1965-66. One of the main tasks in the Third Plan will be to expand facilities for the teaching of science, the aim being to raise the proportion of science students to about 43 per cent. This is essential for meeting the increased demand in a number of different fields, e.g. science teachers for schools, students for engineering and other technical institutions and scientific personnel for industry.

33. A most important feature of the Third Plan will be the provision of a large number of scholarships to enable bright young students to complete their education in both secondary school and college stages.

The present provision for scholarships under this head is proposed to be augmented by about Rs. 10 crores under the Third Plan.

34. *Health and family planning.*—In the field of health services, the Third Plan aims at further extension of existing programmes relating to improvement of environmental sanitation, control of communicable diseases, public health services (including maternity and child welfare, health education and nutrition), family planning and training of medical and health personnel. The programme for eradication of malaria will be completed and nation-wide control campaigns will be initiated for smallpox and tuberculosis. Special measures will be taken to control cholera in the endemic areas. The number of primary health centres will be increased from 2800 to 5000 and of hospital beds from 185,600 to 240,100 during the Third Plan period. The number of practising doctors is expected to go up from 70,000 to 81,000 and of nurses from 27,000 to 45,000. Other important schemes included in the Plan relate to development of indigenous systems of medicine, health education, health insurance school health service, maternity and child welfare and nutrition.

35. In view of the sharp increase in the rate of population growth, a high priority has been given to family planning programmes in the Third Plan. These programmes provide for (a) education and motivation for family planning, (b) provision of services, (c) training, (d) supplies and (e) research. It is proposed to make full use of non-official organisations for ensuring diffusion of the knowledge and the practice of family planning. Family planning activities will be integrated with normal health services and family planning services including facilities for sterilisation will be provided through medical and health centres. The number of family planning centres will increase from 1649 to 8200.

36. *Village water supply and local development works.*—In the Draft Outline of the Third Plan, it was envisaged that the programme of local development works should aim at providing three principal amenities for rural areas, namely, (a) supply of drinking water, (b) roads linking each village to the nearest main road or railway station and (c) provision of village school buildings which might also serve as community centres and village libraries. In view of the overwhelming importance of providing satisfactory facilities for drinking water in the villages, it is proposed that there should be a concentration of effort on the village water supply programme. The other rural amenities should be taken care of through the community development programmes and through the rural works programmes to be undertaken for the fuller utilisation of manpower.

It is an important objective of the Third Plan that to as large an extent as possible, supplies of good drinking water should become available in most villages by the end of the Plan period. It is realised that

this is a difficult aim to achieve and will call both for intensive effort and for effective coordination between all the agencies concerned in carrying out the programme. Surveys of the extent of the problem of rural water supply are at present being undertaken in a number of States. On the basis of these surveys and with due regard to conditions prevailing in different areas, the resources provided for the village water supply programme are intended to be utilised in (a) backward areas, (b) areas not covered by the community development programme, (c) pre-extension blocks and (d) blocks which have completed their first and second stages in the community development programme.

37. The Third Plan also includes provision for adequate water supply for the rapidly increasing urban population. About 664 water supply and drainage schemes at an estimated cost of Rs. 112 crores were taken up in the Second Plan. Such of these schemes as have not yet been completed will be completed and some new urban schemes will also be taken up during the next five years.

38. *Housing.*—As a result of the growth of population and rapid urbanisation, the problem of housing has already become very serious and it is apprehended that it may become worse in future. It is obviously not possible to tackle this problem through public investment alone, although public investment has no doubt an important role to play in certain ways. While the Third Plan will expand considerably the measures which were taken during the previous two Plan periods, it will also supplement the investment that Government may be able to make by adopting appropriate policies regarding location and dispersal of industries, the preparation of master plans for important urban areas and coördinating the effort of the various agencies, both public and private, in a more effective manner. It includes proposals to set up housing boards at the Centre as well as in the States to enable a large number of lower and middle income people to build houses for themselves. The financial assistance for the housing of industrial workers and low income groups, slum clearance and improvement and land acquisition and development will be augmented. Town planning and urban development measures will be taken up in a number of cities. Rs. 10 crores have been provided in the Central Plan and another Rs. 10 crores in the West Bengal Plan for meeting some of the urgent needs of Calcutta which poses a special problem for the eastern region of the country. The programme for rural housing initiated under the Second Plan will be linked more closely with the community development programme and greater attention will be paid to the setting up of brick kilns, manufacture of building components, extension of areas for building new houses and improvement of housing conditions for agricultural workers.

total cost of the programme over the five-year period is reckoned to be about Rs. 150 crores.

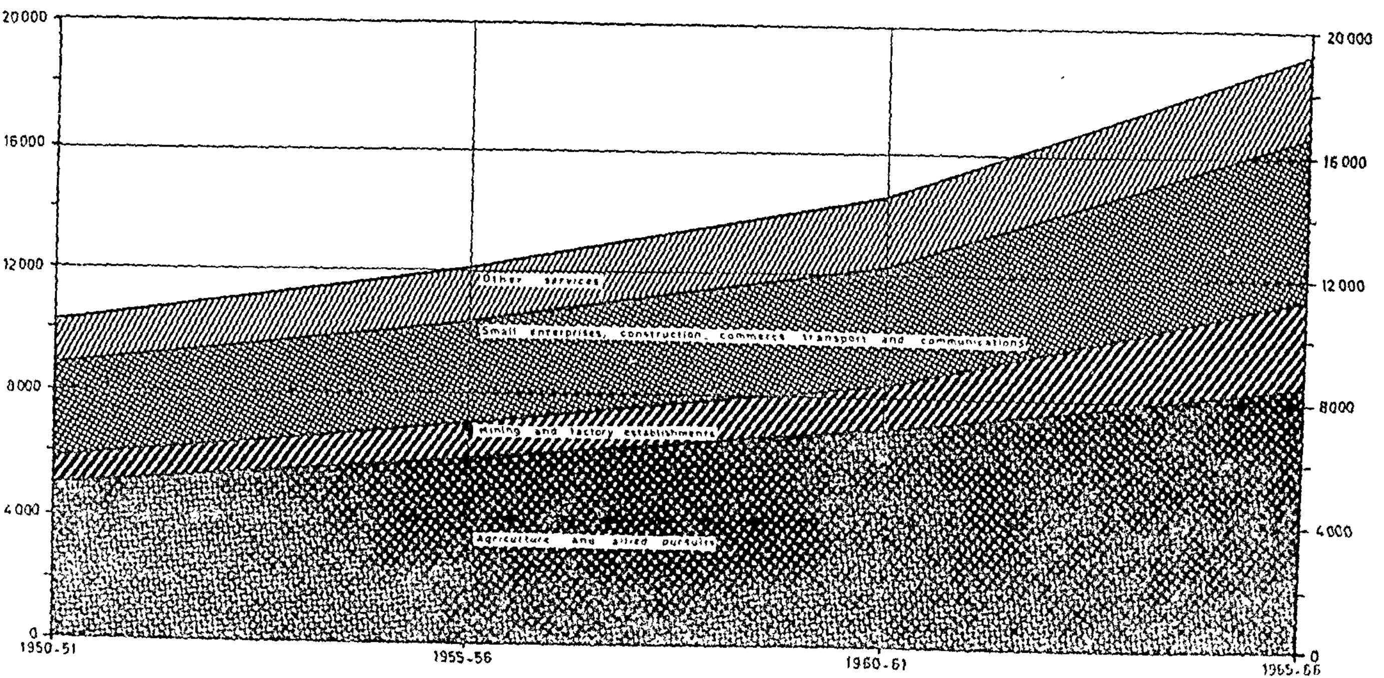
42. A special effort will be made to mobilise active public cooperation in various Plan programmes through voluntary organisations. These organisations will be encouraged to shift the emphasis from purely social welfare to socio-economic activities like construction work. Through the Lok Karya Kshetra programme, facilities will be provided for these organisations to participate effectively in both welfare and production programmes in the rural areas.

43. Compared to the needs of the country, the targets included in the Third Plan are by no means high and in fact some are definitely inadequate. There is, thus, urgent need to achieve these targets through most economical use of available resources, mobilisation of additional resources and increasing efficiency. This will be the constant endeavour of the Central and State Governments in the course of the implementation of the Third Plan and in that endeavour the correct balancing and phasing of projects and of outlays will require the greatest attention. It is possible that in spite of the best endeavours some of the projects will spill over into the Fourth Plan, but the utmost care must be taken to see that the projects which are essential for reaching the target of national income and for strengthening those sectors of the economy which are calculated to make it self-reliant and self-generating are completed in time.

National Income

44. It has been estimated that if all the programmes included in the Plan can be completed in time, national income (at 1960-61 prices) will go up by about 34 per cent. Net output of agriculture and allied sectors will go up by nearly 25 per cent, of mining and factory establishments by about 82 per cent and of other sectors by about 32 per cent. The estimates for agriculture, mining and factory establishments are based largely on the targets of production included in the Plan. But, in the case of other sectors, only indirect estimation is possible and, in many cases, the basic data are quite inadequate. For realising the estimated increase of about 34 per cent in national income, as explained earlier, many difficult conditions have to be fulfilled. One of the most important of these relates to the total invesment to be undertaken. As indicated in Annexure II of this Chapter, the physical programmes included in the Third Plan, specially under industry and transport, entail significantly larger investment than have been provided for within the present scheme of financial provisions and resources in the Plan. With greater effort in mobilising resources which is envisaged, it is hoped to reduce and, if possible, to eliminate this gap. Nevertheless, on present assump-

tions and in view of the various considerations already outlined, it is considered that over the Third Plan period national income should go up by about 30 per cent from about Rs. 14,500 crores (at 1960-61 prices) at the end of the Second Plan to about Rs. 19,000 crores at the end of the Third Plan. On the basis of the present estimates of population, per capita income should rise from about Rs. 330 in 1960-61 to about Rs. 385 at the end of the Third Plan.


NET DOMESTIC PRODUCT BY INDUSTRIAL ORIGIN
(Rs. CRORES AT 1960-61 PRICES)
20000
16000
12000
8000
4000
0
1950-51
1955-56
1960-61
1965-66
Other services
Small enterprises, construction, commerce, transport and communications
Mining and factory establishments
Agriculture and allied pursuits

ANNEXURE I

Production and development: progress and targets

item	unit	1950-51	1955-56	1960-61 estimated	1965-66 targets	percentage increase in 1960-61 over 1950-51	percentage increase in 1965-66 over 1960-61
1	2	3	4	5	6	7	8
1. agriculture and community development							
1·1 agricultural production							
foodgrains	million tons	52·2(a)	65·8(a)	76·0	100·0	46	32
cotton	million bales	2·9	4·0	5·1	7·0	76	37
sugarcane-gur	million tons	5·6	6·0	8·0	10·0	43	25
oilseeds	million tons	5·1	5·6	7·1	9·8	39	38
jute	million bales	3·3	4·2	4·0	6·2(b)	21	55
tea	million lb	613	678	725	900	18	24
tobacco	000 tons	257	298	300	325	17	8
fish	million tons	0·7	1·0	1·4	1·8	100	29
milk	million tons	17·1	19·3	22·0	25·3	29	15
wool	million lb	60	65	72	90	20	25
1·2 agricultural services							
area irrigated (net total)	million acres	51·5	56·2	70·0	90·0	36	29
land reclamation (additional area) (d)	million acres	..	2·7	1·2	3·6	..	200

(a) Estimates of production adjusted for changes in statistical coverage and methods of estimation upto 1956-57.
(b) Excludes mesta which may provide an additional 1·3 million bales in the Third Plan.
(d) Relates to five-year period.

item	unit	1950-51	1955-56	1960-61 estimated	1965-66 targets	percentage increase in 1960-61 over 1950-51	percentage increase in 1965-66 over 1960-61
1	2	3	4	5	6	7	8
soil conservation (additional area benefitted) (d)	million acres	..	0·7	2·0	11·0	..	450
nitrogenous fertilisers consumed	000 tons of N	55	105	230	1000	318	335
phosphatic fertilisers consumed	000 tons of P_2O_5	7	13	70	400	900	471
seed farms (d)	number	..	..	4000	4800	..	20
1·3 community development							
blocks	number	—	1069	3110	5223	..	68
villages covered	000 numbers	—	106	368	550	..	49
population served	million numbers	—	69	204	359	..	76
1·4 cooperation							
primary agricultural credit societies	000 numbers	105	160	210	230	100	110
short and medium term loans advanced	Rs. crores	22·9	49·6	200·0	530·0	773	165
2. power							
2·1 electricity							
installed capacity	million kW	2·3(c)	3·4(c)	5·7	12·7	148	123
generated	million kWh	6575(c)	10777(c)	19850	45000	202	127
2·2 towns and villages electrified	000 numbers	3·7	7·4	23·0	43·0	523	87

3. minerals							
iron ore	million tons	3·2	4·3	10·7	30·0	234	180
coal	million tons	32·3	38·4	54·6	97·0	69	76
4. large scale industries							
4·1 metallurgical industries							
steel ingots	million tons	1·4	1·7	3·5	9.2	150	163
finished steel	million tons	1·0	1·3	2·2	6·8	120	209
pig iron for sale	million tons	0·35	0·38	0·90	1·50	157	67
alloy, tool and special steels (finished)	000 tons	—	—	40	200	..	400
aluminium	000 tons	3·7	7·3	18·5	80·0	400	332
copper (fire-refined and electrolytic)	000 tons	6·6	7·5	8·9	20·0	35	125
4·2 mechanical and electrical engineering industries							
cement machinery	value in Rs. lakhs	—	34(c)	60	450	..	650
sugar machinery	value in Rs. lakhs	—	19	330	1000	..	203
industrial boilers	value in Rs. lakhs	—	—	40	2500	..	6150
machine tools (graded)	value in Rs. lakhs	34	78	550	3000	1518	445
ball and roller bearings	million numbers	0·1	0·9	2·9	14·0(e)	2800	383

(c) Relates to calendar year.

(d) Relates to five-year period.

(e) By working the capacity on three shifts.

item	unit	1950-51	1955-56	1960-61 estimated	1965-66 targets	percentage increase in 1960-61 over 1950-51	percentage increase in 1965-66 over 1960-61
1	2	3	4	5	6	7	8
diesel engines (stationary)	000 numbers	5·5	10·0	40·0	66·0	627	65
tractors	number	—	—	2000	10000	..	400
electric motors (200 b.h.p. and below)	000 h.p.	100	272	700	2500(f)	600	257
electric transformers (33 kv and below)	000 kva	179	625	1200	3500	570	192
electric cables (ACSR) conductors	000 tons	1·7	8·7	22·0	44·0	1194	100
4·3 railway locomotives							
steam	number	7	179	295	1175(*d*)	3214	...
diesel	number	—	—	—	434(*d*)	..	..
electric	number	—	—	—	232(d)	..	..
4·4 rubber manufactures							
automobile tyres	million numbers	—	0·9	1·35	3·0	..	122
bicycle tyres	million numbers	—	5·8	11·0	31·0	..	182
4·5 chemicals							
nitrogenous fertilisers	000 tons of N	9	79	110	800	1122	627
phosphatic fertilisers	000 tons of P_2O_5	9	12	55	400	511	627
sulphuric acid	000 tons	99	164	363	1500	267	313
soda ash	000 tons	45	81	145	450	222	210

caustic soda	000 tons	11	35	100	340	809	240
sulpha drugs	tons	—	83(c)	150	1000	..	567
D.D.T.	tons	—	284	2800	2800	..	—
dyestuffs	million lb	—	4·0	11·5	18·0	..	57
4·6 other industries :							
sewing machines (organised sector only)	000 numbers	33	111	297	700	800	136
bicycles (organised sector only)	000 numbers	101	513	1050	2000	940	90
motor cycles and scooters	000 numbers	—	1·5	18	50	..	178
automobiles	000 numbers	16·5	25·3	53·5	100·0	224	67
ship building	000 GRT	—	50(d)	20	50-60	..	150-200
cotton textiles (mill made)	million yards	3720	5102	5127	5800	38	13
rayon filament	million lb	0·4	16·0	47·0	140·0	11650	198
sugar (g)	million tons	1·12	1·86	3·0	3·5	168	17
steel structural fabrications	000 tons	—	90	150	1000	..	567
cement	million tons	2·7	4·6	8·5	13·0	215	53
petroleum products	million tons	—	3·6	5·7	9·9	..	74
paper and paper board	000 tons	114	187	350	700	207	100
plastics	000 tons	—	0·7	10·0	74·0	..	640

(c) Relates to calendar year.
(d) Relates to five-year period.
(f) 300 h.p. and below.
(g) Relates to crop year—November to October.

item	unit	1950-51	1955-56	1960-61 estimated	1965-66 target	percentage increase in 1960-61 over 1950-51	percentage increase in 1965-66 over 1960-61
1	2	3	4	5	6	7	8
glass and glass-ware	000 tons	92	125	225	440	145	96
industrial gases—oxygen	million cft	—	—	700	1650	..	136
5. village and small industries							
khadi							
traditional	million yards	7·3	28·9	48·0	3500	558	49
ambar	million yards	—	—	26·0		..	
handloom	million yards	742	1471	1900		156	
powerloom	million yards	148(c)	273(c)	375		153	
sericulture	million tons	2·5(h)	3·2(c)	3·6(c)	5·0	44	43
6. transport and communications							
6·1 transport services							
railways: freight carried	million tons	91·5	114·0	154·0	245·0	68	59
roads : surfaced including national highways	000 miles	97·5	122·0	144·0	169·0	48	17
road transport : commercial vehicles on road	000 number	116	166	210	365	81	74
shipping	lakh GRT	3·9	4·8	9·0	10·9	130	21
major ports : handling capacity	million tons	20	25	37	49	85	32
6·2 communications							
post offices	000 numbers	36	55	77	94	114	22
telegraph offices	000 numbers	3·6	5·1	6·5	8·5	81	31
number of telephones	000 numbers	168	280	460	660	174	43

7. education							
7·1 general education							
students in schools	million numbers	23·5	31·3	43·5	63·9	85	47
school going children as percentage of children in respective age-groups :							
primary stage	6-11 years	42·6	52·9	61·1	76·4	79(i)	45(i)
middle stage	11-14 years	12·7	16·5	22·8	28·6	102(i)	55(i)
high/higher secondary stage	14-17 years	5·3	7·8	11·5	15·6	139(i)	57(i)
institutions :							
primary/junior basic schools	000 numbers	209·7	278·1	342·0	415·0	63	21
middle/senior basic schools	000 numbers	13·6	21·7	39·6	57·7	191	46
high/higher secondary schools	000 numbers	7·3	10·8	16·6	21·8	128	31
multipurpose schools	000 numbers	—	0·3	2·1	2·4	..	14
7·2 technical education							
engineering and technology : degree level (intake)	number	4120	5890	13858	19137	236	38
diploma level (intake)	number	5900	10480	25570	37390	333	46
agriculture colleges (intake)	number	1060(j)	1989	4600	6200	334	35
veterinary colleges (intake)	number	434(j)	1269	1300	1460	200	12

(c) Relates to calendar year.
(h) Calendar year 1951.
(i) Worked out from enrolment figures.
(j) Relates to 1951-52.

item	unit	1950-51	1955-56	1960-61 estimated	1965-66 targets	percentage increase in 1960-61 over 1950-51	percentage increase in 1965-66 over 1960-61
1	2	3	4	5	6	7	8
8. health							
8·1 institutions							
hospitals and dispensaries . .	000 numbers	8·6	10·0	12·6	14·6	47	16
hospital beds	000 numbers	113	125	186	240	65	29
primary health units . . .	number	—	725	2800	5000	..	79
family planning centres . . .	number	—	147	1649	8200	..	397
8·2 personnel							
medical colleges (intake) . .	number	2500	3500	5800	8000	132	38
doctors (k)	000 numbers	56	65	70	81	25	16
nurses (k)	000 numbers	15·0	18·5	27·0	45·0	80	67
auxiliary nurse-midwives and midwives (k) . . : .	000 numbers	8·0	12·8	19·9	48·5	149	144
nurse-dais and dais (k) . . .	000 numbers	1·8	6·4	11·5	40·0	539	248
health assistants and sanitary inspectors	000 numbers	3·5	4·0	6·0	19·2	72	222

(k) In practice or in service.

ANNEXURE II

Outlay during the Second Plan and cost of physical programmes in the Third Plan— estimates by heads

(Rs. lakhs)

head of development	estimated outlay in Second Plan: States	Union Territories	States and Union Territories	Centre	total	estimated cost of programmes in Third Plan: States	Union Territories	States and Union Territories	Centre	total
1	2	3	4	5	6	7	8	9	10	11
agricultural production	8367	268	8635	1075	9810	18351	598	18949	3658	22607
minor irrigation	9166	98	9264	230	9494	17269	177	17446	230	17676
soil conservation	1553	8	1561	200	1761	5732	246	5978	1295	7273
animal husbandry	1869	73	1942	200	2142	4592	172	4764	680	5444
dairying and milk supply	958	3	961	244	1205	3086	24	3110	498	3608
forests	1656	122	1778	150	1928	4204	268	4472	667	5139
fisheries	710	26	736	170	906	2090	102	2192	672	2864
warehousing, marketing and storage	310	18	328	170	498	843	10	853	3300	4153
I. agricultural programmes	24589	616	25205	2439	27644	56167	1597	57764	11000	68764
cooperation	3278	55	3333	50	3383	6959	151	7110	900	8010
community development	18744	463	19207	200	19407	28189	578	28767	600	29367
panchayats	460	30	490	1976(a)	2466	2824	56	2880	—	2880
II. community development and cooperation	22482	548	23030	2226	25256	37972	785	38757	1500	40257

(a) Includes expenditure for local development works.

(Rs. lakhs)

head of development	estimated outlay in Second Plan					estimated cost of programmes in Third Plan				
	States	Union Territories	States and Union Territories	Centre	total	States	Union Territories	States and Union Territories	Centre	total
1	2	3	4	5	6	7	8	9	10	11
irrigation	34479	21	34500	2717	37217	58121	10	58131	1803	59934
flood control	(b)	(b)	(b)	4800	4800	5995	137	6132	—	6132
power	41882	914	42796	1753	44549	88315	2345	90660	11312	101972(c)
III. irrigation and power	*76361*	*935*	*77296*	*9270*	*86566*	*152431*	*2492*	*154923*	*13115*	*168038*
industries and minerals	2859	2	2861	87128	89989	7958	32	7990	180240	188230
village and small industries	6949	294	7243	10323	17566	13703	425	14128	12300	26428
IV. industries and minerals	*9808*	*296*	*10104*	*97451*	*107555*	*21661*	*457*	*22118*	*192540*	*214658*
railways	—	—	—	86011	86011	—	—	—	94000	94000
roads	14326	1598	15924	6440	22364	21830	2575	24405	8000	32405
road transport	1502	91	1593	225	1818	2044	559	2603	—	2603
tourism	144	13	157	60	217	394	22	416	350	766
ports and harbours	314	45	359	2980	3339	490	18	508	12500	13008
shipping	—	—	—	5268	5268	—	263 (d)	263	5500	5763
posts and telegraphs	—	—	—	5059	5059	—	—	—	7900	7900
civil aviation	—	—	—	4900	4900	—	—	—	5500	5500
broadcasting	—	—	—	468	468	—	—	—	1100	1100
other transport	52	99	151	53	204	273	25	298	1200	1498
other communications	—	—	—	327	327	—	—	—	930	930
V. transport and communications	*16338*	*1846*	*18184*	*111791*	*129975*	*25031*	*3462*	*28493*	*136980*	*165473*

general education and cultural programmes	16011	721	16732	4072	20804	31906	2104	34010	7800	41810
technical education	2141	31	2172	2600	4772	6986	173	7159	7000	14159
scientific and technological research	—	—	—	—	—	—	—	—	7000	7000
health	13021	566	13587	8047	21634	27114	2566	29680	4500	34180
housing	6411	266	6677	1356	8033	9620	2076	11696	2500	14196
welfare of backward classes	5080	214	5294	2647	7941	7498	389	7887	3500	11387
social welfare	327	10	337	1181	1518	1048	114	1162	1600	2762
labour and labour welfare	769	12	781	1200	1981	2519	189	2708	4400	7108
rehabilitation	—	—	—	6341	6341	—	—	—	4000	4000
public cooperation and local works	—	—	—	—	—	34(c)	—	34	5000	5034
VI. social services	*43760*	*1820*	*45580*	*27444*	*73024*	*86725*	*7611*	*94336*	*473000*	*141636*

(b) In the Second Plan, outlay for flood control is shown at the Centre.

(c) Includes part provision for D.V.C. power programme and Bandel thermal station.

(d) For Andaman and Nicobar Islands.

(e) In addition to this amount, outlay for 'public cooperation' will have to be found within the agreed Third Plan ceiling by suitable adjustment in the following States: Rs. 6 lakhs each in Andhra Pradesh, Bihar, Madras, Madhya Pradesh and West Bengal; Rs. 5 lakhs in Mysore and Rs. 1 lakh in Assam.

(Rs. lakhs)

head of development	estimated outlay in Second Plan					estimated cost of programmes in Third Plan				
	States	Union Territories	States and Union Territories	Centre	total	States	Union Territories	States and Union Territories	Centre	total
1	2	3	4	5	6	7	8	9	10	11
statistics and research	403	7	410	5086(f)	9980	322	27	349	500	849
information and publicity	276	21	297			562	58	620	600	1220
local bodies	415	44	459			310	65	375	—	375
State capital projects	3196	—	3196			2475	—	2475	—	2475
others	507	25	532			1075	933	2008	4100	6108
VII. miscellaneous	*4797*	*97*	*4894*	*5086 (f)*	*9980*	*4744*	*1083*	*5827*	*5200*	*11027*
grand total	198135	6158	204293	255707	460000	384731(g)	17487	402218	407635(h)	809853(h)

(f) Includes also anticipated outlay on account of Department of Atomic Energy, schemes of the Ministry of Finance and office and residential buildings under the programmes of Ministry of Works, Housing and Supply.

(g) The distribution of outlays in West Bengal is subject to adjustments: (i) on account of West Bengal's share in the D.V.C., and (ii) increase in resources estimated at Rs. 43 crores, which the State Goverment expect to raise above the level of Rs. 90 crores shown in Chapter VI—Financial Resources.

(h) This excludes provision of Rs. 200 crores for 'Inventories'.

ANNEXURE III

Outlays during the First, Second and Third Plans for States and Union Territories

(Rs. crores)

State/Union Territory	First Plan (acutal)	Second Plan (estimated)	Third Plan (programme outlay)
Andhra Pradesh	108	175	305
Assam	28	51	120
Bihar	102	166	337
Gujarat	224(a)	143	235
Jammu and Kashmir	13	25	75
Kerala	44	76	170
Madhya Pradesh	94	145	300
Madras	85	167	292·9
Maharashtra	(b)	207	390
Mysore	94	122	250
Orissa	85	85	160
Punjab	163	148	231·4
Rajasthan	67	99	236
Uttar Pradesh	166	227	497
West Bengal	154	145	250(c)
total—States	1427	1981	3847·3
Andaman and Nicobar Islands	2	3	9·8
Delhi	10	14	81·8
Himachal Pradesh	8	16	27·9
Manipur	2	6	12·9
N. H. and T. A.	—	4	7·1
Tripura	3	9	16·3
Laccadive, Aminidive and Minicoy Islands	—	0·4	1·0
N.E.F.A	4	5·6	7·1
Pondicherry	1	4	6·9
total—Union Territories	30	62	174·8(d)
total—all India	1457	2043	4022·1

(a) For the composite State of Bombay.

(b) Indicated against Gujarat.

(c) Provisional.

(d) Includes an unallocated amount of Rs. 4 crores.

CHAPTER VI

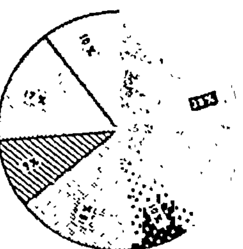
FINANCIAL RESOURCES FOR THE PLAN

THE programmes of development in the public sector included in the Third Plan are estimated to involve an outlay of over Rs. 8000 crores. These programmes are closely interconnected and every effort has to be made to secure their full and orderly implementation. There are, however, uncertainties to be reckoned with. The actual expenditure incurred on several important projects depends upon how far the foreign exchange required is available and when precisely the necessary capital goods and equipment can be imported and installed. Progress in respect of important projects is linked with advance in certain others which are complementary. Any lag in one item of the investment programme may affect the pace of work on other items. The Third Plan postulates that the fullest effort will be made to mobilise internal resources and to carry through the accepted programmes with expedition. Nevertheless, some shortfalls in expenditure may be unavoidable, and part of the outlays corresponding to the physical programmes that have been approved may spill over into the Fourth Plan. As regards external assistance, it has been assumed that the total of actual payments against such assistance during the Plan period will be limited to Rs. 2100 crores (apart from assistance for meeting repayment liabilities) although the requirements on present estimates add up to a higher figure. Bearing these considerations in mind, financial outlays in the Third Plan are being taken at Rs. 7500 crores: Rs. 6300 crores by way of investment expenditure and Rs. 1200 crores by way of current outlays on social services and other developmental but recurring items. The financial provisions envisaged at present could, it is felt, be improved upon if production and savings increase sufficiently; the objective must be to implement the physical programmes accepted by raising resources beyond the level indicated by the present estimates.

2. Of the investment outlay in the public sector of Rs. 6300 crores, about Rs. 200 crores represents, transfers to assist selected investments in agriculture, industry, housing etc., in the private sector. Private investment over the Third Plan is estimated at Rs. 4300 crores; the resources to be found by the private sector are of the order of Rs. 4100 crores.

FINANCING OF PLAN OUTLAYS IN THE PUBLIC SECTOR

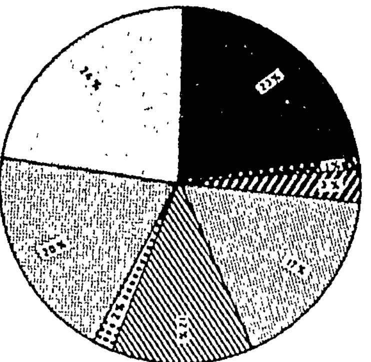
FIRST PLAN



Rs. 1960 crores

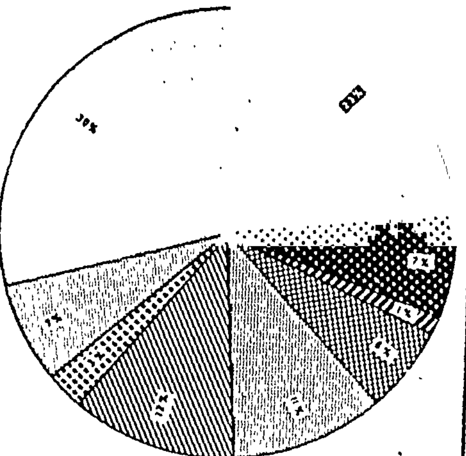
	FIRST PLAN Rs. crores	
	752	TAXATION & SURPLUSES OF RAILWAYS
	205	PUBLIC LOANS (net)
	304	SMALL SAVINGS & UNFUNDED DEBT
	178	MISCELLANEOUS CAPITAL RECEIPTS (net)
	333	DEFICIT FINANCING
	188	EXTERNAL ASSISTANCE

SECOND PLAN



Rs. 4600 crores

THIRD PLAN



Rs. 7500 crores

	SECOND PLAN Rs. crores	THIRD PLAN Rs. crores	
	1052	1710	ADDITIONAL TAXATION
	-50	550	BALANCE FROM CURRENT REVENUES
	150	100	CONTRIBUTION OF RAILWAYS
		450	SURPLUSES OF OTHER PUBLIC ENTERPRISES
	760	800	PUBLIC LOANS (net)
	570	865	SMALL SAVINGS & UNFUNDED DEBT
	80	275	MISCELLANEOUS CAPITAL RECEIPTS (net)
	948	550	DEFICIT FINANCING
	1090	2200	EXTERNAL ASSISTANCE

3. The total investment programme for the Third Plan thus comes to Rs. 10,400 crores—Rs. 6100 crores in the public sector and Rs. 4300 crores in the private sector. The public sector has to find Rs. 7500 crores in all, including in this total Rs. 200 crores mentioned above and Rs. 1200 crores for current outlays.

4. An investment of the order of Rs. 10,400 crores over the five year period will mean a stepping up of the rate of investment from the current level of about 11 per cent of national income to about 14 per cent. Part of this investment is to be financed through external assistance. The rate of domestic savings will have to be raised from the current level of about 8·5 per cent of national income to about 11·5 per cent by the end of the Third Plan. It is evident that this will require the fullest effort to increase total output as envisaged in the Plan and steady pursuit of economic policies designed to keep consumption within the limits set by the requirements of investment. Considering the progress that has been made over the last decade in increasing production as well as in strengthening the potential for further expansion, the investments and savings goals and the targets of the Plan are attainable, given efficient mobilisation and deployment of resources and availability of foreign exchange.

5. Over the last ten years there has been a striking increase in investment in the economy. Public sector investment at the commencement of the First Plan was around Rs. 200 crores. By the end of the First Plan, it had risen to about Rs. 450 crores. In 1956-57, the very first year of the Second Plan, it reached a level of Rs. 500 crores and in the final year of the Second Plan it rose to about Rs. 800 crores. Thus, the increase in public sector investment in financial terms over the last ten years has been about fourfold. The Second Plan has also been characterised by high levels of investment in the private sector. While data on the break-up of this investment are not adequate, it is noteworthy that in large and medium industry and mining, the level of investment averaged Rs. 145 crores over the last five years as compared to Rs. 45 crores in the First Plan period.

6. The First Plan involved a sizeable step-up in investment—from about 5 per cent of national income to over 8 per cent. The substantial increases—both in agricultural and in industrial production—that were recorded during the Plan period made it possible to achieve this step-up in investment without causing any significant strain on the domestic price level or on the balance of payments. In fact, the prices fell sharply about the middle of the First Plan and the index of wholesale prices was 8 per cent lower at the end of that Plan as compared to the pre-Korean level.

7. The scale of investment envisaged in the Second Plan was significantly larger than in the First Plan. The pattern of investment was also markedly different. The investments in industry, transport and power by the public sector totalled Rs. 2650 crores as compared to Rs. 820 crores in the First Plan. Private investment in industry, transport and power in the Second Plan period was about Rs. 1025 crores as compared to about Rs. 310 crores in the First Plan period. These developmental tasks involved a greater strain on the economy, especially on the balance of payments.

Resources: Physical and Financial

8. Mobilisation of resources for securing an adequate rate of growth is the crux of the problem of planning in an under-developed economy. The problem may be presented in terms of the physical inputs needed and their availability or as one of finding a quantum of financial resources adequate to cover the cost of the various development programmes, public and private, included in the Plan. The two approaches, if worked out fully, should give the same result. Resources in physical terms are disparate, and the task of working out detailed physical balances that could be relied on in practice is a difficult one, especially in view of the inadequacy of data and the large number of assumptions inevitably involved. The estimation of needs of resources in financial terms has also its limitations. Each project authority is apt to make its estimate of the financial resources required on the assumption that it can secure whatever real resources it needs at current prices, irrespective of what the demands from other project authorities or the economy as a whole are likely to be. This is where the financial and physical possibilities have to be assessed together. The question ultimately is whether there are physical resources corresponding to the financial outlays. This aspect has to be taken care of by providing in the Plan adequate increases in outputs in key sectors and by ensuring that certain types of resources are obtained from abroad.

9. A Plan of economic development is not merely a list of programmes or projects to be implemented; it is a blue-print for the allocation of all the resources available to the community as between their different uses. The physical inputs needed for the accepted programmes have to be provided for; the consequential demands or adjustments called for elsewhere in the economy have also to be taken due account of. These complex inter-relations cannot always be precisely gauged in advance. The scale of investment and the pattern of resource mobilisation have, in the last analysis, to be considered in terms of an overall judgement as to what the optimum feasible is. This judgement may have to

be reviewed from time to time and there has to be a measure of flexibility in the Plan to permit the necessary adjustments in outlays. Since, however, the objective is to carry through the physical programmes approved, and since any shortfall or slowing down on these affects the pace of further advance, effort has to be concentrated on mobilisation of the resources required. The techniques of resource mobilisation and the scope for using each one of these more effectively have thus to be kept under continuous review.

10. Whether one starts with the question as to how much of resources can be raised in various ways or whether one takes the scale of outlays as the starting point is a matter of procedure rather than of principle. The process of arriving at conclusions is one of assessment and reassessment of both these with a view to determining the optimum scale of effort and the results to be secured within a given period. Resources are not a fixed fund to be drawn upon; they depend partly on the scale of investment being undertaken and the resulting increases in output during the Plan period. A Plan of development has thus to be accepted on a consideration of whether the proposed scale and pattern of investment gives the results that are felt to be adequate in terms of certain economic and social criteria and whether, on a view of the growth of resources in the period of the Plan, the outlays proposed can be financed without causing serious strains and stresses in the system. It is on a balancing of these considerations that the phasing of programmes and limits for financial outlays have to be determined.

FINANCE FOR THE PUBLIC SECTOR

11. The resources position for the Third Plan has been studied in detail over the last two years or so. The estimates presented in the Draft Outline were based on 1960-61 budgets of the Central and State Governments. During August-September 1960, discussions were held with State Governments to arrive at an assessment of their resources for the Third Plan period. Some of these estimates were again reviewed in the course of discussions with the States on their Plan outlays. On the basis of these data and a further examination of the Centre's budget for 1960-61, revised estimates of the financial resources likely to be available to the Centre and to the States were submitted to the National Development Council in January, 1961. In the light of these estimates, the National Development Council decided that the resources available for the Third Plan should be taken at Rs. 7500 crores, although the cost of the physical programmes being approved was larger. The following Table gives the resources estimates for the Third Plan as approved by the

National Development Council and the corresponding estimates of the Draft Outline:

Table 1: Resources for the Third Plan

(Estimates for the Draft Outline and as presented to the N.D.C. in January 1961)

(Rs. crores)

item	estimates for the Draft Outline			estimates as presented to N.D.C. in January 1961		
	Centre	States	total	Centre	States	total
1 balance from current revenues at 1960-61 rates of taxation	385	—35	350	433	—12	421
2 contribution of Railways	150	..	150	71	..	71
3 surpluses of other public enterprises	300	140	440	300	149	449
4 loans from the public (net)	520	330	850	500	350	850
5 small savings (net)	190	360	550	208	377	585
6 provident funds (net)	170	60	230	170	79	249
7 steel equalisation fund (net)	160	..	160	160	..	160
8 balance of miscellaneous capital receipts over non-plan disbursements	325	—205	120	441	—233	208
9 total of 1 to 8	2200	650	2850	2283	710	2993
10 additional taxation including measures to increase the surpluses of public enterprises	1100	550	1650	1100	610	1710
11 budgetary receipts corresponding to external assistance	2200	..	2200	2200	..	2200
12 deficit financing	550	..	550	524	26	550
total	6050	1200	7250	6107	1346	7453

12. The National Development Council noted that considering the needs of the economy, every effort had to be made to bridge the gap between the figure of Rs. 7500 crores for the financial outlays indicated by the estimates of resources and the requirements adding upto over Rs. 8000 crores for implementing the physical programmes envisaged. It was evident that the answer to the problem depended upon how far domestic savings could be stepped up to match the larger needs. The Council appointed a Committee to study and explore further possibilities in this direction. In the course of the last few months, further studies have been made of the 1961-62 budgets of the Central and State Governments and of the scope for getting more resources under each of the heads shown in the table above. In the light of this examination the Committee felt that there was warrant for taking a more optimistic view of the total resources that could be raised by the Centre and the States. The latest budget estimates show a greater buoyancy in revenue than was allowed for earlier. It was, however, not possible at this stage to set out precisely the lines along which the gap between the requirements of physical programmes

and the financial provisions could be bridged. It was also necessary to bear in mind the limitations in respect of foreign exchange resources. The problem would need continuous review in the light of the advance made each year in mobilising resources. Accordingly, while the financial outlays are at present being retained at Rs. 7500 crores, sustained efforts will be made to improve upon this estimate and to diminish the gap through more effective mobilisation of savings.

13. The scheme of financing the public sector Plan that is now envisaged is as indicated in the Table below. For comparison, the contribution by each major source of finance in the Second Plan period is also shown in the Table:

Table 2: Financial resources

(Estimates for the Second and the Third Plans)

(Rs. crores)

	item	Second Plan		Third Plan
		as initially estimated	as estimated now	
1	balance from current revenues (excluding additional taxation)	350	—50	550
2	contribution of Railways	150	150(a)	100
3	surpluses of other public enterprises	(b)	(b)	450
4	loans from the public (net)	700	780(e)	800
5	small savings (net)	500	400	600
6	provident funds (net)	250	170	265
7	steel equalisation fund (net)		38	105
8	balance of miscellaneous capital receipts over non-plan disbursements		22	170
9	total of 1 to 8	1950	1510	3040
10	additional taxation including measures to increase the surpluses of public enterprises	450(d)	1052	1710
11	budgetary receipts corresponding to external assistance	800	1090(c)	2200
12	deficit financing	1200	948	550
	total	4800	4600	7500

14. Over the Second Plan period, aggregate financial outlay in the public sector has been below the target initially accepted but a little above the revised target. The inflationary pressures and the balance of payments

(a) Inclusive of increased fares and freights.

(b) Included in items 1 and 8 in the Table.

(c) Includes investment by the State Bank out of P.L. 480 funds.

(d) In addition there was a gap of Rs. 400 crores to be covered by additional domestic effort.

(e) This includes investment of P.L. 480 funds by the Reserve Bank in special securities in 1960-61.

difficulties that emerged in the early stages of the Plan necessitated a re-appraisal of the resources outlook and it was decided (a) to limit the five-year outlays to Rs. 4500 crores or so and (b) to mobilise external assistance on a larger scale and to concentrate effort on the implementation of 'core' projects. The Second Plan target for additional taxation has been substantially exceeded. On the other hand, the balance available from current revenues has shown a net fall of Rs. 400 crores as compared to the estimates that were worked out when the Plan was formulated. On small savings also, the collections over the five-year period have been about Rs. 100 crores less than the level envisaged earlier. Deficit financing in the Second Plan period has been within the limits set in the Plan. Part of this deficit financing was offset by the drawing down of foreign exchange reserves. The rise in prices that has occurred despite this indicates that the scope for further deficit financing in the coming years is limited.

15. The experience of the Second Plan highlights the fact that despite all the care that may be taken in estimating the contribution likely to be secured from each of the sources indicated in the table, the outturn on individual items is in practice, liable to diverge from the estimates. For the five-year period ahead, it is, therefore, essential to focus attention on the adequacy of the financing scheme as a whole rather than on estimates in respect of each item taken by itself. The estimates of surpluses from revenues, for example, have to be made on certain assumption as to the growth of tax yields in response to the increase in economic activity. The growth rates in the economy may, however, vary from year to year and the response of tax yields depends on where the new incomes flow. Similarly, on the expenditure side the likely trends in non-Plan expenditure, both developmental and non-developmental, can be estimated in terms only of broad orders of magnitude. A small change in the assumptions can make a sizeable difference to the total figure under this head, especially since account has to be taken not only of the Central budget but of the budgets of fifteen States. Then, again, the data available regarding surpluses of public enterprises other than the railways are incomplete. Some of the projects are in the early stages of production; some will commence production in the latter part of the Plan period. The estimates of unit costs for all these projects are not precise; the estimates of the surpluses that have been made at this stage can be regarded as only rough indications. The different modes of raising resources are at some point interdependent, and it is possible that while in one situation more can be secured by way of taxation, in another situation recourse to market borrowing may yield a better result. Timely availability of external assistance has also an important bearing on the domestic savings and investment effort. In the paragraphs that follow the estimates for the Third Plan in respect of each item are explained.

16. *Balance from revenues.*—Revenue receipts of the Central and State Governments over the Third Plan are estimated to total Rs. 9250 crores

as compared to the estimated receipts of about Rs. 1600 crores in 1960-61 (R.E.). The aggregate expenditures, non-developmental and developmental including those on the maintenance of schemes completed by the end of the Second Plan period, are estimated to add up to Rs. 8700 crores. Thus the surplus available for financing Plan outlays is at present estimated at Rs. 550 crores over the Plan period. For working out the estimates of receipts, account has been taken of the increases in production in important lines as also of the expected rise in national income as a whole. On the side of expenditure, past trends have been projected, making allowance for expected variations and after providing for committed expenditure in respect of schemes that were part of the Second Plan but will, on the completion of that Plan, become a prior charge on revenues. The substantial increase in the expected balance from revenues during the Third Plan as compared to the Second reflects the increases in tax receipts that have taken place in the last two years partly as a result of increased economic activity and partly because of the additional tax effort that has been put through. Taxation undertaken in 1961-62 is not taken into account under this head; it is part of the additional tax effort of Rs. 1710 crores envisaged for the Third Plan.

17. *Contribution of the Railways.*—This represents the surpluses of the expected current earnings of the railways over their working expenses (excluding expenditure on 'Open Line Works' which is treated as investment) after providing for depreciation outlays and the payment of interest and dividend in accordance with existing arrangements. In the Second Plan the contribution amounted to Rs. 150 crores; this was inclusive of receipts from increases in fares and freights carried out during the Second Plan period. The estimated surplus of Rs. 100 crores over the Third Plan is, however, exclusive of any additional resources that the railways might be able to raise during the Plan period by way of adjustments in fares and freights.

18. *Surpluses of other public enterprises.*—This item represents the balance of resources available with public enterprises after providing for their working expenses, normal replacements, interest and dividend. In other words, it does not represent merely net profits; it also includes net accretions to depreciation reserve funds and other funds of these enterprises, the assumption being that these funds will be utilised for financing the expansion programmes of these enterprises. The estimate is tentative, as the data on which it is based are not sufficiently firm. Of the total of Rs. 450 crores, Rs. 300 crores is in respect of Central Government enterprises, namely, iron and steel, fertilisers, oil companies, refineries, posts and telegraphs etc., and the remaining Rs. 150 crores is to come from the enterprises of State Governments, namely, electricity boards, transport undertakings etc.

19. *Loans from the public.*—Market borrowings over the Second Plan period amounted to Rs. 780 crores. The target set for the Third Plan is being taken at Rs. 800 crores, inclusive of the net collections under the prize bonds scheme. In comparing the target for the Third Plan with the total of market borrowings in the Second Plan period, it has to be borne in mind that the latter include substantial investments in Government securities by the State Bank of India out of the deposits of P.L. 480 funds as also sizeable purchases by the Reserve Bank. The net absorption of market loans by the public, including commercial banks, but excluding the Reserve Bank, was less than Rs. 300 crores. In the Third Plan period, P.L. 480 funds to the credit of the U.S. authorities will be held with the Reserve Bank which will buy special securities created for the purpose. Credit on this account has been taken under external assistance. Whatever support the Reserve Bank may have to give to the loan programme has of course to figure under deficit financing. The estimate of Rs. 800 crores for the Third Plan period envisages considerable increase in the absorption of Government securities by the Life Insurance Corporation, the various Provident Funds and other investors. Credit has also been taken for moderate absorption by commercial banks. Borrowings—other than normal bank advances—by electricity boards or other enterprises of State Governments are included in the respective State targets for market loans. The requirements of the cooperative sector are, however, not included in the above estimate. The Plan envisages a considerable expansion of this sector and in assessing what the capital market can provide by way of subscriptions to Central and State loans, the claims of cooperative agencies have to be borne in mind. Market borrowings of the order envisaged postulate a sizeable growth in the resources of the commercial banks and careful regulation of bank credit to the private sector.

20. *Small savings.*—The target of small savings in the Second Plan was Rs. 500 crores; the actual collections are now estimated at about Rs. 400 crores. The potentialities of small savings are large and they will grow further as incomes increase. The movement has so far been confined largely to urban and semi-urban areas. In the coming years a considerable proportion of rural savings will go to cooperative agencies and it is as important to ensure that the finance for the cooperative sector is provided for as to enlarge the resources coming into the public sector. Nevertheless, small savings represent a promising field in which further effort can bring large results. The question is one of proper organisation and the lines along which the present field agencies can be strengthened deserve careful study.

21. *Provident funds, Steel Equalization Fund and Balance of Miscellaneous Capital receipts over non-Plan disbursements.*—As compared to net additions to provident funds of the order of Rs. 170 crores in the

Second Plan, the estimate for the Third Plan works out at Rs. 265 crores. This is because of the increased pay scales for certain classes of employees both at the Centre and in the States and the introduction of a compulsory provident fund scheme at the Centre. Under Steel Equalization Fund, the net accrual in the Third Plan period is estimated at Rs. 105 crores. In respect of other items of capital receipts, including betterment levies, funds and deposits, the net receipt in the Third Plan period is estimated at Rs. 170 crores as compared to Rs. 22 crores in the Second Plan. This is the net result of a large number of items of receipts and expenditure on capital account. The main sources of receipts are betterment levy, recoveries of loans and advances from local bodies, cultivators and others, transfer from revenues to funds, net receipts under miscellaneous deposits, funds, remittances etc. On the expenditure side, the items to be reckoned, among others, are compensation payments to refugees and zamindars, loans and advances to cultivators, losses on State trading, if any, and other items of non-Plan disbursements, including outlays on civil works outside the Plan. The estimate of Rs. 170 crores for the Third Plan period has been worked out on a study of the past trends and on the assumption that non-Plan capital disbursements are kept down to the minimum. The estimate also postulates that recoveries in respect of arrears of outstanding loans and advances will be expedited.

22. *Budgetary receipts corresponding to external assistance.*- The credit of Rs. 2200 crores taken against this item corresponds to total external assistance of Rs. 3200 crores that is envisaged in the Plan. The entire amount of Rs. 3200 crores does not come to the public exchequer. Rs. 450–500 crores of the total receipts of external assistance will go towards repayments of loans maturing during the Third Plan. About Rs. 300 crores might go directly to the private sector by way of private capital inflows or loans from agencies like the I.B.R.D., the International Finance Corporation and the U.S. Export-Import Bank. Another Rs. 200 crores may represent agreed retentions of rupee resources by the U.S. authorities and additions to buffer stocks from P.L. 480 imports. Thus, about Rs. 1000 crores in all would not be available for the budget; the net credit that can be taken under this head is about Rs. 2200 crores as against the total external assistance of Rs. 3200 crores.

23. *Deficit financing.*—In view of the rise in prices that has occurred during the Second Plan period and the fact that, unlike in the Second Plan, there is no cushion of foreign exchange reserves that can be drawn upon as an offset to deficit financing, it is proposed to limit deficit financing in the Third Plan to the minimum warranted by the genuine monetary needs of the economy. There is, of course, no precise way of estimating the limits of safe deficit financing. Increases in money supply take place not only through the budgetary operations of Government but

also through credit creation by the banking system. Both these have to be viewed together and their appropriate limits decided upon in the light of relative requirements as well as what the economy can absorb in the aggregate. On a broad view of all these factors, the limit for deficit financing in the Third Plan period has been placed at Rs. 550 crores, exclusive of the direct extension of credit by the Reserve Bank to co-operative agencies. The amount of deficit financing that can be undertaken has, however, to be judged from year to year in the light of emerging economic trends. What is required for implementing the Plan, whether in the public or in the private sector, are real resources and these depend upon the rate at which production goes up and the extent to which the community is prepared to defer consumption and enlarge savings. Deficit financing within moderate limits has a place in developmental planning but if it adds to purchasing power unduly at a time when the need is to keep it down so as to restrict consumption within the limits provided for the Plan, the consequences to the economy can be highly deleterious.

24. The following Table gives the resources estimates for the Third Plan separately for the Centre and the States:

Table 3: Resources for the Third Plan

(Rs. crores)

	item	Centre	States	total
1	balance from current revenues (excluding additional taxation)	410	140	550
2	contribution of Railways	100	..	100
3	surpluses of other public enterprises	300	150	450
4	loans from the public (net)	475	325	800
5	small savings (net)	213	387	600
6	provident funds (net)	183	82	265
7	steel equalisation fund (net)	105	..	105
8	balance of miscellaneous capital receipts over non-plan disbursements	428	—258	170
9	total of 1 to 8	2,214	826	3,040
10	additional taxation including measures to increase the surpluses of public enterprises	1,100	610	1,710
11	budgetary receipts corresponding to external assistance	2,200	..	2,200
12	deficit financing	524	26	550
	total	6,038	1,462	7,500

Resources of State Governments

25. On the basis of the discussions held with the States in August–November, 1960 the total of their resources came to Rs. 1416 crores. Annexure I at the end of this chapter gives the State-wise details of this

estimate. This estimate needed revision in two respects: (i) interest liability on account of fresh loans from the Centre in the Third Plan and (ii) reduction in the earlier estimates of borrowings from the public. At the time of the discussions, precise estimates of interest liability in respect of loans from the Centre could not be made, and the *ad-hoc* figures taken at the time were found to be on the low side. In respect of borrowings from the public, the estimate as emerging from the discussions had to be corrected so as to make it consistent with the overall estimate for the Centre and the States together. After making these two adjustments the estimate of States' resources came to Rs. 1346 crores.

26. The further review of States' resources undertaken in the light of the 1961-62 budgets indicates that the resources picture for the States is considerably better; the total of States' resources now comes to Rs. 1462 crores. The main factor in the improvement is the larger transfers of resources from the Centre under income-tax and shareable excises. The following Table gives the estimates of States' resources as presented to the National Development Council in January, 1961, and as re-worked recently in the light of the 1961-62 budgets.

Table 4: States' Resources for the Third Plan

(Rs. crores)

	item	estimates as presented to the N.D.C. in January, 1961	estimates as worked out in the light of 1961-62 budgets
1	balance from current revenues at 1960-61 rates of taxation	—12	140
2	surpluses of public enterprises	149	150
3	loans from the public (net)	350	325
4	small savings (net)	377	387
5	provident funds (net)	79	92
6	balance of miscellaneous capital receipts over non-plan disbursements	—233	—258
7	total of 1 to 6	710	826
8	additional taxation, including measures to increase the surpluses of public enterprises	610	610
9	deficit financing (i. e. sale of securities)	26	26
	total	1,346	1,462

The State-wise details of this revised estimate have yet to be worked out.

27. With States' resources at Rs. 1462 crores and Central assistance at Rs. 2375 crores, the total of the resources available for financing State Plans comes to Rs. 3837 crores. This is close to the programme limit of Rs. 3847 crores which has been suggested for State Plans. On present indications, thus, the gap between the programme limit and financial resources for the States is, if anything, negligible. With strict economies in expenditure, especially on outlays outside the Plan, it might, in fact, be possible for the States to finance out of their own resources some increases in outlays in respect of rural employment schemes.

Additional Taxation

28. The additional taxation target accepted initially in the Second Plan was Rs. 450 crores. It was recognised that this target was inadequate and that the bulk of the gap of Rs. 400 crores shown in the financing scheme for the Second Plan would have to be made good by additional taxation. The total of additional taxation actually put through in the course of the Second Plan was Rs. 1052 crores, which is considerably in excess of the initial target plus the gap just mentioned. Even with this measure of additional taxation the proportion of tax revenues to national income rose from about 7.5 per cent. of national income at the beginning of the Second to about 8·9 per cent by the end of that Plan. With the normal increase in tax yields as a result of rising national income and the additional taxation of Rs. 1710 crores that is proposed over the Third Plan period, the proportion of tax revenues to national income will go up to 11·4 per cent by the end of the Third Plan. Considering the requirements of the Third Plan and the rise in incomes expected, this order of additional taxation is essential as well as practicable, and a substantial beginning towards this effort has been made in the Central budget for 1961-62.

29. It was stressed both in the First and in the Second Plans that a progressive enlargement of public savings is an essential element in sound financing of public sector programmes in a developing economy. Undoubtedly, there are limits to taxation and a number of complex economic as well as other considerations are involved in working out the concrete taxation measures to be adopted for realising a given target. To a considerable extent, programmes of investment in the public sector have to be financed by channelling into the public exchequer a part of the aggregate savings arising in the private sector. The programmes of public borrowings and small savings have to be oriented to this end. Nevertheless, a significant element in the financing of investment in the public sector has to be public savings, that is, the surpluses of revenue receipts over non-investment expenditure together with the surpluses of

public enterprises. The need to maximise the surpluses of public undertakings has to be borne in mind in deciding on the price policy in respect of the products of those enterprises. Enlargement and ploughing back of profits of public enterprises have an important contribution to make to the financing of development.

30. The choice between different forms of taxation has to be made on a consideration of the existing levels and the likely incidence and effects of further increases in each direction. There is scope in a developing economy for increasing the receipts both from direct as well as from indirect taxation. Direct taxation seeks to keep down consumption and enlarge the investible surplus by reducing disposable incomes. Indirect taxation works through a reduction in the quantum of goods that can be brought against the incomes that are spent. The relative merits of each form of taxation have to be determined pragmatically. The crucial point is to locate the surpluses as they are being generated in consequence of development so that additional taxation could be directed appropriately. The details of tax measures to be adopted during the Third Plan will have to be decided upon in the light of the economic situation as it emerges from year to year. It must be stressed, however, that if taxation in the aggregate is inadequate, this means not merely a loss of so much of resources for investment but a pressure on domestic prices that may affect the structure of production and aggravate economic inequalities.

31. In the field of income tax, the scope for raising the rates generally is limited, although adjustments in tax rates in particular income brackets may be necessary from time to time. The objective of these adjustments must be to enlarge public resources and to spread the burden equitably as between different groups of income earners. There are at present a number of other taxes on personal incomes and wealth: the wealth tax, the capital gains tax, the expenditure tax and estate duty. The yield from these taxes is relatively small. The object of all these taxes taken together is not only to secure larger receipts for the public exchequer but also to reduce economic inequalities. It is essential in this context that the relevant tax laws leave as few loopholes as possible for evasion or avoidance of taxes. In regard to taxation of corporate incomes, a number of tax incentives and concessions are at present being given for investment. These have contributed in no small measure to high levels of private investment over the last five years. These incentives and concessions will need to be kept under continuous review so as to ensure that their benefit accrues to types of investment that have a high priority in the Plan. It becomes particularly important when these concessions are being given that the expense accounts of companies are carefully scrutinised and suitable provisions made in the

tax laws to ensure that wasteful expenditures are kept down, if not eliminated.

32. The Third Plan will involve a substantial increase in indirect taxation. The number of assessees paying direct taxes in India is very small. Although collections of direct taxes are expected to improve in the course of the Third Plan, the total of resources required cannot be raised without taxing consumption through indirect taxation over a wide range. In some cases, such taxation may be most effective at the point of final consumption; in other cases intermediate products or raw materials may be found more suitable. Indirect taxation along these lines tends to raise the price to be paid by the domestic consumer. This is a sacrifice that has to be accepted as part of the Plan. It should also not be forgotten that if taxation is insufficient, the benefit is likely to accrue to middlemen and traders in the shape of undue profits. Some of these indirect taxes affect the poorer classes but a great many fall on those who have comparatively high incomes. There is, in other words, an element of progression even in indirect taxes. There is, however, no escape from the fact, that in a country like India where the bulk of the people are poor, resources on an adequate scale cannot be raised without calling for a measure of sacrifice from all classes of the people.

33. A word may finally be said in this context regarding the role of the state governments in raising additional resources through taxation. It is inevitable that the larger part of the additional tax effort has to be put through by the Central Government but it is no less important that the State Governments also raise an adequate share for themselves. Taxation of the rural sector falls largely within their field. They have also to mobilise more effectively the elastic sources of revenue such as sales taxes. The collections under this head have improved noticeably in recent years but discussions with several States indicate that there is considerable scope still for a tightening of administration in this respect. On present estimates, the States have to raise about Rs. 610 crores out of the additional taxation target of Rs. 1710 crores envisaged for the Third Plan. The additional taxation by the States in 1961-62 has been below expectations. It will be essential to make up for this in the coming years. Effort will also be necessary in respect of public undertakings of State Governments to enlarge their surpluses.

PRIVATE INVESTMENT

34. From the point of view of resources to be raised, the investment programmes of the public and private sectors have to be viewed together, as both draw upon the same pool of savings. The question, in other words, is whether if the public investment programme is to be financed along the lines indicated above, the private sector will be able

to find adequate resources for carrying through the programmes for which responsibility has been placed on it in the Plan. The question could be put the other way also: given the investment programmes in the private sector, will the public sector be able to raise enough resources to cover its needs? The answer to these questions depends obviously on the estimates that can be made regarding the growth of savings in the aggregate and the adequacy of techniques for channelling them. A great deal depends upon the rate at which total output increases and the adequacy of the various constraints envisaged on consumption. Since data in respect of investment and savings over a considerable part of the economy are inadequate it is not possible to attempt any very precise estimates regarding the sources and uses of funds for private investment. But, broadly speaking, considering the trends in the Second Plan period, and on a view of the likely trends in the course of the Third Plan, it is felt that a total of Rs. 4300 crores by way of private investment can probably be financed, consistently with the public sector claims on savings.

35. The following Table sets out the likely levels of investment in the private sector over the Third Plan period under major heads as compared to the initial estimates of the Second Plan and the estimates of investment as now revised in the light of subsequent studies:

Table 5: Investment in the private sector*

(Rs. crores)

group	Second Plan		Third Plan estimates
	original estimates	revised estimates	
1 agriculture (including irrigation)	275	675	850
2 power	40	40	50
3 transport	85	135	250
4 village and small industries	100	225	325
5 large and medium industries and minerals	575	725**	1100**
6 housing and other construction	925	1000	1125
7 inventories	400	500	600
total	2400	3300	4300

It must be emphasized that the estimates given above are exceedingly rough. The improvement in the total of private investment in the Second Plan as compared to the original estimate is in large part due

*These figures represent aggregate investment in the private sector including that financed out of resources transferred from the public sector.

**These figures do not include investment by way of modernisation and replacement.

to a change in the basis of estimation in the light of later data. For the Third Plan, a substantial step up is envisaged in the field of industry; large as well as small scale, and transport, the total under these heads rising from Rs. 1085 crores to Rs. 1675 crores. The increases envisaged in agriculture, and housing and other construction are moderate and should pose no serious problem, especially as investment in these sectors is largely self-financed. The financial resources required for the investment programmes for large and medium industries and in the field of minerals are large. Broad estimates regarding the financing of investments in these fields are given in Chapter XXVI While the total requirements of capital for new investment as well as modernization and replacement in industry and mining come to Rs. 1350—1400 crores, the resources available would appear to be somewhat short relatively to needs. On this basis some of the programmes in this sector may probably spill over into the Fourth Plan, specially since they require foreign exchange.

36. Of the total investment of over Rs. 4300 crores in the private sector, Rs. 200 crores will be provided by way of transfer of resources from the public sector. The assistance by the Reserve Bank to agriculture, small-scale industries and cooperatives will also be on a larger scale. External assistance to the private sector may be of the order of Rs. 300 crores. Investment in the private sector during the Second Plan has been at high levels and there is evidence of greater readiness on the part of private enterprise to avail itself of the opportunities being created by the development process. Investment in the private sector of the order of Rs. 4300 crores appears by no means difficult of achievement. Some of the estimates given in the table above, such as on housing and other construction and transport may well be exceeded. Investment in agriculture depends partly on savings in the rural sector itself and partly on the assistance available to agriculture from Government and cooperative agencies. Considering the increase in agricultural production envisaged in the Plan it would probably be desirable to let investment in agriculture exceed substantially the figure shown in the Table. Although, as stated earlier, all investment is in a sense financed from a common pool of savings, it has to be recognised that some savings flow in particular directions only. For example, the farmer or the small artisan is apt to save if he is investing in his own farm or workshop. The decisions to invest and save are thus inter-linked. The same is true to an extent of housing. If investment of this type were to be reduced, there would probably be less savings. However, it has to be recognized that in a planned economy private investment, specially investment that draws on the organized capital market, has to be regulated with due regard to the limitation of aggregate resources for investment and the requirements of the public sector.

EXTERNAL RESOURCES

37. The problem of external resources is a difficult one for a country in its early stages of industrialisation. With the best effort it can make to enlarge its foreign exchange earnings, it cannot for a number of years cope with the increasing import requirements of the economy. A shortfall in internal resources can, to an extent, be met by letting the economy operate under some strain. Foreign exchange is, however, a specific resource which has either to be earned by larger exports or has to be secured through an inflow of external resources. There was little strain on India's balance of payments in the First Plan period, but foreign exchange reserves fell sharply by Rs. 481 crores in the first two years of the Second Plan. There has been a further drawing down of these reserves in the subsequent years, and the Third Plan commences with a level of reserves that cannot bear any significant further decline.

38. The Third Plan has been formulated on the basis that it would be advantageous from the point of view of the recipient country as well as the donor countries to plan for substantial amounts of external assistance for a relatively short period rather than to proceed in terms of varying and uncertain amounts of assistance over an indefinite period. Development effort in India over the Third and Fourth Plans has to concentrate on expansion of capital goods and machine building industries—together with corresponding development of mining, power and transport—on a scale that would enable the country to build up in this period sufficient capacity to produce domestically the bulk of the capital goods and machinery that it will require in subsequent periods for supporting high levels of investment. This is a priority that follows as much from the objective of maximising the rate of growth of the economy as from the need to attain a viable external accounts position within a foreseeable future. It is evident in this context that the foreign exchange requirements—and the requirements of external assistance—in the Third Plan will be substantial.

BALANCE OF PAYMENTS : FIRST AND SECOND PLANS

39. The First Five Year Plan was directed mainly towards increasing agricultural production and strengthening the economic overheads of development, like irrigation, power and transport. In the field of industry, the stress was mainly on utilisation of existing capacity more fully; public sector investment in industry and mining was only a small proportion of the total. The direct foreign exchange component of the First Plan was about Rs. 400 crores. In 1951-52, the first year of the Plan, there was a balance of payments deficit of Rs. 234 crores, but the situation improved substantially in the subsequent years because of the increase in agricultural as well as industrial production. The deficit in

the balance of payments over the Plan period as a whole was Rs. 318 crores. Of this, Rs. 196 crores was financed by external assistance and Rs. 122 crores by a draft on foreign exchange reserves.

40. The following table shows the balance of payments position for the Second Plan period (figures for 1960-61 are subject to revision).

Table 6: India's balance of payments: Second Plan

(Rs. crores)

items	1956-57	1957-58	1958-59	1959-60	1960-61 (preliminary)	total Second Plan 1956-61
1 exports	635	594	576	623	625	3053
2 imports	1099	1233	1030	923	1075	5360
3 trade balance	—464	—639	—454	—300	—450	—2307
4 invisibles (net) (excluding official donations)	111	102	81	71	55	420
5 current account (net)	—353	—537	—373	—229	—395	—1887
6 capital transactions (net) (excluding official loans)	—36	—23	—10	—58	—45	—172
7 overall balance	—389	—560	—383	—287	—440	—2059
financed by						
A external assistance (including P.L. 480 and 665 assistance)	113	265	341	295	392	1406
B IMF drawings (net)	55	35	..	—24	—11	55
C use of foreign exchange reserves	221	260	42	16	59	598
total	389	560	383	287	440	2059

The balance of payments deficit over the five year period is estimated at about Rs. 2100 crores as compared to the Plan estimate of Rs. 1100 crores. The external accounts came under heavy pressure soon after the Plan commenced, and the foreign exchange resources declined by Rs. 481 crores within a period of two years. A re-appraisal of the economic situation in 1958 led to the decision to scale down the Plan somewhat and to concentrate on "core" projects. The total external assistance utilised for the Plan has turned out to be more than 50 per cent over the level that was originally envisaged. The drawing down of foreign exchange resources amounted to Rs. 600 crores, as compared to the Plan estimate of Rs. 200 crores.

41. The adverse foreign exchange situation that developed during the Second Plan was due partly to underestimation of the direct foreign exchange requirements of the Plan and partly to failure to take into account sufficiently the growing import needs of a developing economy. The sharp rise in the tempo of private investment in the early stages of the Plan also contributed to the difficulties, although this probably affected the timings of deficits rather than their total over the Plan period. The difficulties arising from these shortcomings in planning were aggravated by two bad agricultural seasons during the Plan period. Food imports provided for in the balance of payments estimates for the Plan were 6 million tons. Actual food imports over the Plan period have been about 20 million tons. Imports of raw cotton have also been on a substantial scale. However, since the emergence of the foreign exchange crisis a stringent import policy has been followed. A rigorous system of exchange allocations on a half-yearly basis has been adopted and no significant fresh commitments have been made unless they were covered by external assistance.

FOREIGN EXCHANGE REQUIREMENTS OF THE THIRD PLAN

42. The estimates of balance of payments trends over a five year period inevitably present difficulties and must be regarded only as the best judgment that can be formed at this particular stage in the light of the available data. The Draft Outline of the Third Plan presented in June 1960 estimated export receipts at Rs. 3450 crores over the five-year period. The net receipts on invisibles were estimated at Rs. 120 crores. These total receipts would, it was suggested, be matched by payments in respect of maintenance imports totalling also Rs. 3570 crores. On this basis the requirements of external assistance for the Third Plan added up to Rs. 2600 crores as follows:

	(Rs. crores)
1 payments for imports of capital goods and equipment required for Plan Projects	1900
2 components, balancing equipment, etc. for increasing the production of capital goods	200
3 re-financing of maturing obligations	500
total .	2600

This total was exclusive of P.L. 480 imports. Taking into account the agreement entered into a month earlier with the United States for import of foodgrains valued at about Rs. 600 crores, the balance of payments gap for the Plan period was estimated at Rs. 3200 crores.

43. These estimates have been gone over again in recent months. The total investment envisaged in the Third Plan is reckoned at Rs. 10,400 crores and its direct foreign exchange requirements are estimated at

Rs. 2030 crores. As explained earlier, investment in the public sector is being taken at Rs. 6100 crores—this corresponds to the outlay of Rs. 7500 crores—and that in the private sector at Rs. 4300 crores. The foreign exchange requirements for these investment programmes are shown in the table below:—

Table 7: Investment and foreign exchange requirement: Third Plan

(Rs. crores)

head	total investment	foreign exchange
A public sector		
1 agriculture and community development	610	30
2 major and medium irrigation	650	50
3 power	1012	320
4 village and small industries	100	20
5 large and medium industries and minerals (including oil)	1470	690
6 transport and communications	1486	320
7 social services and miscellaneous	572	90
8 inventories	200	*
total (public sector)	6100	1520
B private sector		
1 large and meduim industries, minerals and transport	1350	495
2 villages and small industries	325	15
3 others	2625	Neg.
total (private sector)	4300	510
C grand total (A+B)	12400	2030

44. In addition to these import requirements related to Plan projects, there are the general needs of the economy by way of raw materials, components, replacement machinery, etc., to be provided for. In the estimates that follow a provision of Rs. 3650 crores has been indicated for such imports. This is Rs. 80 crores more than the provision in the Draft Outline. Actually, the needs are larger; an estimate of Rs. 3800 crores over the five-year period would not be too high. Nevertheless, it is not possible at this stage to provide more resources for this purpose. This means that some under-utilisation of capacity will have to be tolerated.

* Foreign exchange component of 'inventories' is included under other heads.

45. Maintenance imports for 1961-62 are estimated at Rs. 746 crores. They will decline in the latter part of the Plan as the production of raw cotton, iron and steel, aluminium, industrial machinery and transport equipment, chemical intermediates, etc. increases progressively in the course of the Plan. These increases in domestic output will result in some savings in imports, but these will in part be counter-balanced by increased requirements in certain other lines.

46. The provision of Rs. 200 crores suggested in the Draft Outline for the import of components and other intermediate products needed to increase the output of machinery and transport equipment for the investment programmes included in the Plan is being retained. It should be emphasised in this context that the dividing line between maintenance and developmental imports is by no means clear-cut. The provision of Rs. 200 crores mentioned above is meant primarily to highlight the fact that the execution of Plan projects requires the import not only of complete machines but also of materials to fabricate equipment in the country. The components and intermediate products of various kinds required for maintaining the production of capital goods at full capacity level add up to a much higher figure, and these requirements will grow as machine-building capacity develops. On a broader view, many of the other maintenance imports included in the estimate of Rs. 3650 crores are also to be used to increase the output of capital goods. For example, a major use of non-ferrous metals is the manufacture of cables to form part of electrical transmission systems, and the bulk of the estimated consumption of steel will go into construction and the fabrication of capital equipment. Foreign assistance for financing such imports thus contributes as directly for the fulfilment of the Plan as imports of machinery and equipment and, it is, indeed vital that a part of the total assistance for the Plan is secured in the form of such "non-project" imports.

47. It has been evident for some time past that a greatly intensified export effort is essential if the country is to be in a position to meet its growing import requirements and to move forward progressively towards a balance in external accounts. The objective, as mentioned earlier, is to ensure that the economy is able to earn enough by way of exports so that it can, after a period of ten years or so, reduce substantially the dependence on assistance from abroad. Considerable stress has been laid on export promotion for the last two or three years. What is needed now is a clear acceptance of the sacrifices involved and sustained follow-up action with a view to getting results on a scale that is commensurate with needs. The lines along which this intensified effort is to be directed and the measures needed for improving on export performance have been indicated in another chapter.

48. Some other items in the balance of payments have also been re-estimated in the light of later data. The following Table sets forth the balance of payments estimates for the Third Plan as they now emerge:

Table 8: Financing of foreign exchange requirements for the Third Plan

(Rs. crores)

item	total Second Plan	total Third Plan	1961-62	annual average Third Plan
A Receipt				
1 exports	3053	3700	667	740
2 invisibles (net) (excluding official donations)	420*	nil	22	nil
3 capital transactions (net) (excluding receipts of official loans and private foreign investment)	—172	—550	—133	—110
4 external assistance . . .	927@	2600	575**	520
5 draft on foreign exchange reserves .	598	nil	nil	nil
total (1 to 5)***	4826	5750	1131	1150
B Payment				
1 imports of machinery and equipment for Plan projects	4826	1900	325	380
2 components, intermediate products etc. for raising production of capital goods		200	60	40
3 maintenance imports		3650	746	730
total (1 to 3)***	4826	5750	1131	1150

49. It will be seen from the above that the total receipts from exports during the Third Plan period are now being taken at Rs. 3700 crores as compared to the actual receipts of Rs. 3053 crores during the Second Plan period and the estimate of Rs. 3450 crores given in the Draft Outline. During the last few months further studies have been made of the import requirements of the economy and the steps necessary to meet them. It is clear that without a substantial move forward on exports, further progress of the economy will be seriously jeopardised. The estimate of Rs. 3700 crores shown in the Table is the minimum to be aimed at; the needs of the situation are, in fact, larger. Exports, however, take time to grow and it is not possible to estimate precisely what level of earnings is, in fact, likely to materialise over the five year period. The estimate of Rs. 3700 crores has beeen worked out on the basis of a study of the export possibility in respect of all major commodities, and the

*Includes reimbursements from the U.S.A. for freight expenses on P.L. 480 imports initially incurred by India.

**Represents external assistance required for financing imports as shown below.

@Including net drawings on the I.M.F.

***P.L. 480 imports are excluded from both sides—about Rs. 534 crores for the Second Plan and Rs. 600 crores for the Third Plan.

fullest effort must be made to realise this target. The trends in exports should be kept under review at the highest level throughout the period of the Plan and all steps taken to ensure that export earnings are maximised. Two points need to be emphasised in this context. Firstly, while increased production will help in enlarging the surpluses available for export, foreign exchange earnings have at the present juncture to be increased even by sacrifice of domestic consumption. Secondly, exports will flow only to the extent that the prices of our products are competitive. It will be essential in the coming years not only to restrain consumption in the interest of exports, but also to increase productivity and to keep down costs.

50. Over the last five years net receipts from invisibles have shown a falling trend—from Rs. 111 crores in 1956-57 to Rs. 71 crores in 1959-60. The estimated net receipts for 1960-61 come to Rs. 55 crores. The falling trend reflects the increasing payments of interest and dividend on the one hand and the declining receipts from foreign exchange holdings abroad. In the Third Plan period some improvement in gross receipts, particularly under foreign travel, transportation and insurance, is expected. This improvement will, however, be more than offset by the increase in interest liabilities on account both of the Second and the Third Plan loans. Provision has also to be made for the payment of 50 per cent of the freight on P.L. 480 imports. For 1961-62 a surplus of Rs. 22 crores on invisibles is estimated. This will, however, fall progressively in the subsequent years, so that over the five-year period, the receipts and payments in respect of invisibles will more or less balance.

51. The repayments of loans and credits falling due within the Third Plan period total Rs. 450 crores. Other capital transactions are estimated to involve a net outflow of Rs. 41 crores. The payments to Pakistan under the Indus Water Treaty agreement and to Kuwait for the return of Indian currency call for further foreign exchange resources amounting to Rs. 59 crores. The total provision required for capital repayments in the period of the Third Plan thus comes to Rs. 550 crores.

52. What emerges on the whole is that the balance of payments position will continue under strain and that the external account will barely balance even with exports of the order of Rs. 3700 crores. This target of exports is by no means easy of achievement. It postulates fairly favourable conditions abroad, and an overriding priority to exports in domestic policy decisions. It must be stressed in this connection that the import requirements of machinery and equipment for the Plan are higher by Rs. 130 crores—Rs. 2030 crores as compared to the earlier estimate of Rs. 1900 crores. In presenting the estimates in the Table above, it has been assumed that payments out of external assistance for such imports will be limited to the total of Rs. 1900 crores. This means that effort will have to be made to finance the balance by increased export

earnings even beyond the level indicated in the Table. The total external assistance for the Third Plan is being taken at Rs. 2600 crores as in the Draft Outline. This is exclusive of P.L. 480 imports. Since, as stated above, the balance of payments position will continue to be a difficult one, it will be essential in the Third Plan period to continue the system of foreign exchange budgeting and allocations in all its rigour. It is evident that in the coming years the scope for licensing new industrial capacity for which there is no provision in the Plan will, at best, be strictly limited. Even in cases where imports of plant and equipment can be financed from external resources, the point to consider would be whether the related imports of raw materials, components, spares, etc. can be provided for. Any revision of the industrial targets in the Plan would, in other words, have to be considered from all aspects, including availability of foreign exchange, of complementary domestic resources, and of adequate transport, power and technical personnel.

53. India received valuable assistance towards the Second Plan from the International Bank of Reconstruction and Development and a number of friendly countries. Early in 1960 the Bank sent out a Mission of three eminent bankers to study India's developmental problems and requirements. The report of the Mission indicated, inter alia, the broad lines along which resources from abroad could assist in the furtherance of the tasks envisaged in the Third Plan. Thereafter, an expert mission from the Bank visited the country and made a detailed technical study of the Plan, including its foreign exchange aspects. There has been for some time past general recognition abroad that developmental assistance to be most effective and fruitful has to be made available on an assured basis over a number of years; that it has to take into account not merely the requirements of particular projects but of the developmental programme as a whole; and that the terms of repayment have to be adjusted to the anticipated growth in the recipient country's capacity to create the necessary export surplus. These tasks obviously require concerted action on the part of industrialised countries, including the international agencies concerned.

54. Over the past year or so, several meetings have taken place under the sponsorship of the International Bank of Reconstruction and Development of the Consortium of friendly countries interested in India's economic development, and it is gratifying to note that at the last meeting of the Consortium held from May 31 to June 2, 1961, India has been assured of assistance totalling $ 2286 million (Rs. 1089 crores) in order both to provide immediate support to her balance of payments and to cover mainly the import orders to be placed during 1961-62 and 1962-63. The United States has agreed to provide the largest share amounting to just under 50 per cent of the total ($ 1045 million). This is in addition to the P.L. 480 commodity assistance of about $ 1300 million in respect of which agreements were signed earlier. The other

members of the Consortium have offered assistance to India totalling $ 1241 million (Rs. 591 crores) mostly to cover commitments in the first two years of the Third Plan; West Germany, $ 425 million; the U.K., $ 250 million; Japan, $ 80 million; Canada $ 56 million; France, $ 30 million; and the International Bank together with the International Development Association, $ 400 million. The U.S.S.R. had already authorised earlier two credits amounting to Rs. 238 crores for use on Third Plan projects. A number of other friendly countries, namely, Czechoslovakia, Yugoslavia, Poland and Switzerland, have also extended credits totalling Rs. 67 crores for projects in the Third Plan.

55. The carry-over of total assistance available from the authorisations of the Second Plan is of the order of Rs. 365 crores. This, together with the fresh assistance mentioned above, gives the Third Plan a good start. Further meetings of the Consortium are envisaged for reviewing the progress of the Third Plan and for considering India's further requirements for the Plan. Some countries, not yet members of the Consortium, have also expressed interest in India's Plans. These developments in the field of external assistance are highly encouraging: they represent a bold and cooperative approach to the problem of assisting development in the under-developed parts of the world. They highlight correspondingly the need for maximum effort on our part to mobilise domestic resources with the utmost vigour, and to ensure in every possible way that the assistance that is available is utilised without delay and to the fullest benefit of the economy. It is also vital in this context that the utmost possible effort should be made to increase exports on a continuing and progressive scale. It is hoped that the industrialised countries will on their part assist by removing such restrictions as may at present exist on imports from developing countries.

56. The balance of payments difficulties that the country is facing are, it must be stressed, not short-term or temporary; they will continue for several years to come. External assistance is essential for this period, but the aim must be to make the economy more and more self-reliant, so that it is able to support within a period of ten or twelve years an adequate scale of investment from its own production and savings. Normal inflows of foreign capital may continue but reliance on special forms of external assistance has to be reduced progressively and eliminated. The Third Plan represents a crucial stage in this process.

CONCLUSIONS

57. The resources position for the Third Plan, it may be stressed, in conclusion, is inevitably a strained one. The development effort to be undertaken has to be commensurate with the need to ensure a statisfactory rate of growth in national income and in productive capacity. The

process of transformation of a stagnant economy commenced in the First Plan and accelerated in the Second Plan has to be carried forward further with even greater speed. The recent population trend as revealed by the census makes the task for the next ten or fifteen years more arduous. It is essential in this situation to call for the maximum effort and sacrifice the community is capable of.

58. The financial provision of Rs. 7500 crores that has been accepted for the public sector programmes is not to be interpreted as indicating the limit of possibilities in this regard. As stated earlier, the lines along which savings can be enlarged progressively during the Third Plan period merit intensive and continuous study. There has to be a close scrutiny of all non-Plan expenditures; economies in expenditure, both on Plan and on non-Plan items, can release some resources for financing development. The experience of the Second Plan suggests that the scope for taxation may, in fact, be larger than is foreseen at this stage. Provident funds, extension of life insurance and similar social security schemes to institutionalise savings are a potential source for further resources. There is need for a country wide savings drive, particularly in the rural areas. In the States steps are being taken to place greater responsibilities on local self-governing institutions. Larger resources for development can be mobilized if through these institutions the community is induced to take greater interest and participate in local developmental programmes.

59. The limit to financial resources is never an absolute one; it is related to the quality of effort that is brought to bear on implementation of projects, on garnering of their surpluses, and on prevention, through fiscal and other measures, of leakages of resources into consumption or non-priority investment. Substantial investments have been made in the public sector over the last ten years and every effort must be made to ensure that they yield an adequate surplus on the basis of which to plan further advance. Development has in due course to become self-financing; the surpluses from past investments constitute the source for further development. It is important that in choosing their projects for implementation, the Central as well as State Governments keep constantly in mind the need to get results from these investments as quickly as possible. Even a comparatively small delay in completing a project and putting it into productive use can make a significant difference to the resources available for investment. The point is that as an economy develops, even marginal improvements in planning and execution over a number of points can yield a large return in the aggregate. With adequate attention to these aspects of the problem, resources can be raised beyond the limits that are at present indicated.

60. The problem of resources thus links up with the problem of administrative and organisational efficiency; the quest for additional resources has necessarily to be a continuing one and on this wider plane as well. The crucial tests for the Third Plan are two: (a) the extent to which the production of food and raw materials can be increased—what is needed is a striking advance rather than a varying performance; and (b) the energy and drive that are forthcoming for securing the substantial increases needed in export earnings. Given success in these directions, the present limitations of finance can progressively be overcome.

ANNEXURE I

States' resources for the Third Plan

(As on the basis of the discussions held during August—November, 1960)

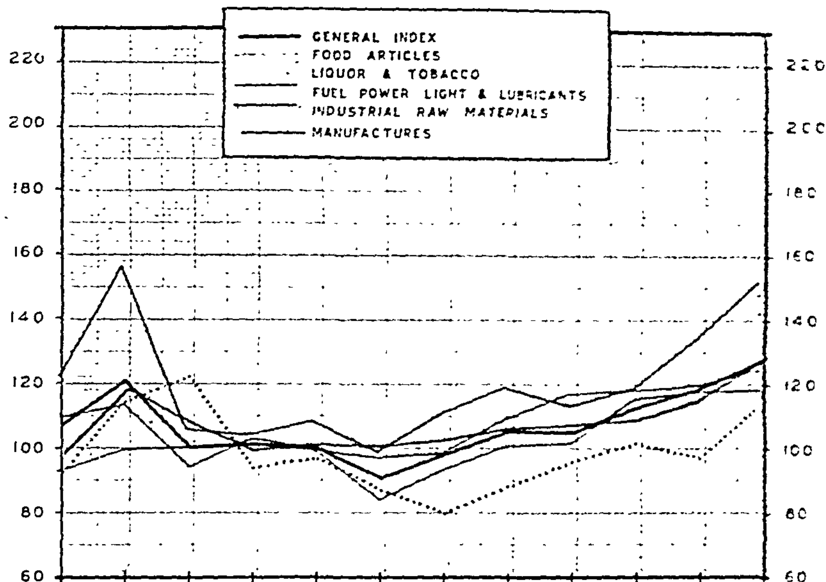
(Rs. crores)

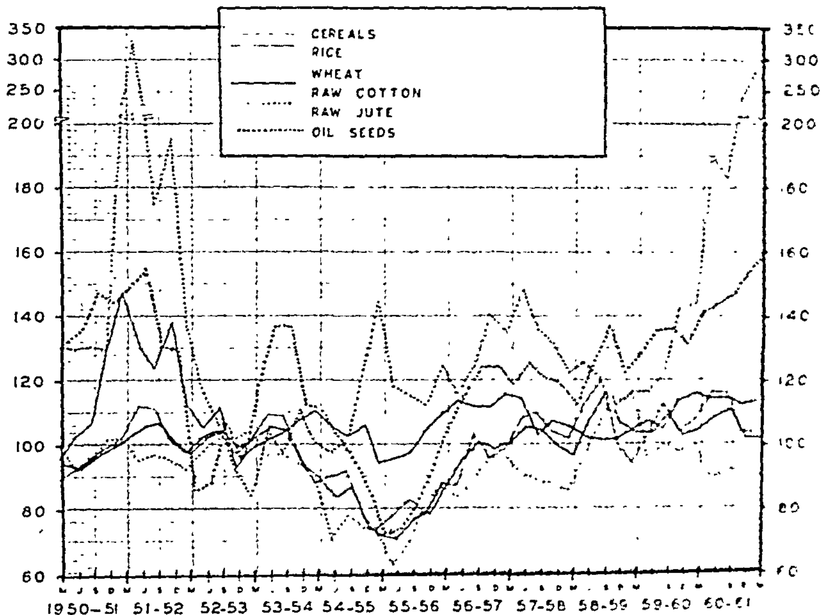
	Andhra Pradesh	Assam	Bihar	Gujarat	Jammu & Kashmir	Kerala	Madhya Pradesh	Madras	Maharashtra	Mysore	Orissa	Punjab	Rajasthan	Uttar Pradesh	West Bengal	total all States
1 balance from current revenues at 1960-61 rates of taxation	14·8	7·0	19·8	10·2	8·0	10·6	−7·7	−30·2	30·6	9·8	−21·1	14·0	0·5	−43·5	11·3	34·1
2 loans from the public (net)	40·0	9·0	23·0	30·0	..	23·0	25·0	52·9	36·9	14·7	21·0	16·0	20·0	35·0	27·6	374·1
3 share of small savings	17·5	12·0	42·5	39·2	2·3	8·0	17·0	20·0	66·8	10·0	8·5	35·0	10·0	50·0	38·5	377·3
4 unfunded debt (net)	3·2	2·8	8·0	4·0	1·7	3·0	2·3	5·9	9·0	5·5	1·5	3·9	5·5	17·3	5·5	79·1
5 balance of miscellaneous capital receipts over non-plan disbursements	−29·7	−17·2	−36·6	−6·4	−8·2	−19·2	−1·4	−33·7	15·3	..	−6·7	−28·3	10·0	−30·6	−40·6	−233·3
6 contribution of enterprises	6·2	3·4	12·3	11·0	1·2	9·6	9·8	35·1	9·4	13·0	1·8	16·4	2·0	9·8	7·7	148·7
7 withdrawal from cash and other reserves	..	..	..	5·0	..	..	..	6·0	..	15·0	..	..	..	..	..	26·0
8 resources without taking into account additional taxation	*52·0*	*17·0*	*69·0*	*93·0*	*5·0*	*35·0*	*45·0*	*56·0*	*168·0*	*68·0*	*5·0*	*57·0*	*48·0*	*38·0*	*50·0*	*806·0*
9 additional taxation	53·0	16·0	50·0	29·0	8·0	23·0	48·0	45·0	52·0	42·0	23·0	40·0	32·0	109·0	40·0	610·0
10 total resources after taking into account additional taxation	*105·0*	*33·0*	*119·0*	*122·0*	*13·0*	*58·0*	*93·0*	*101·0*	*220·0*	*110·0*	*28·0*	*97·0*	*80·0*	*147·0*	*90·0**	*1416·0*

*Revision of this amount to Rs. 133 crores has been suggested by the State Government.

INDEX OF WHOLESALE PRICES

BASE 1952 – 53 = 100





CHAPTER VII

PRICE POLICY FOR THE THIRD PLAN

PRICE policy in a developing economy has to concentrate on two main objectives: (a) it must ensure that the movements of relative prices accord with the priorities and targets that have been set in the Plan; and (b) it must prevent any considerable rise in prices of essential goods that enter into the consumption of low income groups. Both these aspects were stressed in the First and the Second Plans, and various measures were taken in the course of these Plans to correct or moderate undesirable trends. Prices, however, fluctuated widely in the First Plan period and they have shown a rising trend through the Second Plan period. At the commencement of the Third Plan, the levels of wholesale prices and cost-of-living are already high and it is essential to ensure that there is no accentuation of inflationary pressures in the course of the Third Plan and that the levels of living of the more vulnerable classes in society are safeguarded.

PRICES IN THE FIRST PLAN

2. Table 1 on the following page indicates the price trends over the First Plan period. The index of wholesale prices at the end of the Plan was about 22 per cent lower than in March 1951. It must be borne in mind, however, that this is a somewhat misleading comparison as inflationary pressures were at their height in 1951 because of the Korean boom. As compared to 1950, the fall in the general index of prices was lower—about 8 per cent; prices of food articles fell by about 11 per cent; some of the other groups such as fuel, power, light and lubricants and manufactures showed a rise. With the end of the Korean war and following the dis-inflationary fiscal and monetary measures taken by Government in the course of 1951, prices recorded a marked fall, the index coming down from 125·2 in March 1951 to 99·9 in March 1952. The index was more or less steady around this level for the next two years. The bumper crop of 1953-54 resulted in a sharp fall in prices, especially in the prices of foodgrains; the index for food articles came down from 102·2 in March 1953 to 98·6 a year later and further to 82·9 in March 1955. It was in this situation that the ceiling for Plan outlays was raised and some purchases of foodgrains were made on Government account. By July 1955, a distinctly upward trend in prices emerged. This trend continued for the rest of the Plan period. The index of wholesale prices in March 1956 was 98·1, *i.e.*, only slightly below the 1952-53 level.

Table 1: Index number of wholesale prices: 1950—1956

(base : 1952-53 = 100)

(March : average of weeks)

commodity	1950	1951	1952	1953	1954	1955	1956	percentage change in 1956 over 1950	percentage change in 1956 over 1951
I food articles	108·3	122·4	93·7	102·2	98·6	82·9	92·8	—14·3	—24·2
cereals	92	100	95	100	88	70	86	—6·5	—14·2
pulses	80	102	85	98	71	49	77	—3·8	—24·5
II liquor & tobacco	91·6	112·9	121·5	92·8	96	86	78·7	—14·1	—30·3
III fuel, power, light and lubricants	91·1	97·5	98·0	98·0	95·7	96·7	96·8	+6·3	—0·7
IV industrial raw materials	119·1	153·7	103·2	101·5	106·2	97·2	109·4	—8·1	—28·8
raw cotton	93	144	109	96	108	92	107·0	+15·0	—25·7
oil seeds	132	149	85	115	109	71	106	—19·7	—28·9
V manufactures	98·9	118.7	107.6	98·9	100·6	101·1	102·9	+4·0	—13.3
intermediate products	102·1	132·6	108·4	99·0	98·5	97·4	110·5	+8·2	—16·7
finished products	98·3	116·5	107·5	98·8	101·2	101·7	101·5	+3·4	12·8
all commodities	106·4	125·2	99·9	100·8	100·3	90·8	98·1	—7·8	—21·7

3. The all-India working class cost-of-living index (1949=100) was 103 in March 1951. It varied considerably from year to year declining to a level of 94 in March, 1955, but rising again to 100 by the end of the Plan period. Over the five years, the index showed a fall of about 3 per cent, but an upward trend had already started before the First Plan ended, the rise in the index in the twelve months ending March. 1951, being more than 6 per cent.

4. While it is true that the level of prices at the commencement of the First Plan was unduly high and a corrective fall was necessary, there is little doubt that the decline in foodgrains prices that occurred about the middle of the Plan period was excessive and harmful. This downward trend could not be arrested in time because there was considerable doubt *for some time as to the appropriate level at which Government ought to* buy.

Prices in the Second Plan

5. The Second Plan has been characterised by a persistent upward trend in prices though, of course, part of the rise in prices was a corrective to the earlier decline. Over the five-year period, the rise in the general index of wholesale prices has been about 30 per cent; food articles as a group have gone up by some 27 per cent; industrial raw materials by 45 per cent; manufacturers by over 25 per cent. Table 2 on the following page indicates these trends.

6. It will be observed that the index for cereals which was below 100 in March, 1956 rose sharply over the next three years; pulses also showed a similar trend. The index for cereals was back to 100 in March, 1961, that for pulses was 93. It is the rise in the other constituents of 'food articles' that accounts for the continued uptrend in the index for that group. Relative shortage of foodgrains was the major factor accounting for price rises in the early stages of the Second Plan. In the later parts of the Plan period, the leading factor in the upward trend of prices has been shortage of agricultural raw materials. Of the rise of 14 per cent in the index of wholesale prices since March 1959, some two-fifths is attributable to the rise in raw material prices, and another two-fifths was accounted for by the rise in the prices of manufactured goods—partly in consequence of the rise in raw material prices.

Table 2: Index number of wholesale prices: 1956—61

(base : 1952-53=100)

(March : average of weeks)

commodity	1956	1957	1958	1959	1960	1961	percentage rise (+) in 1961 as compared to 1956
I food articles	92·8	102·3	102·3	113·8	117·0	117·6	(+)26·7
cereals	86	99	95	102	103	100	(+)16·3
pulses	77	84	78	113	90	93	(+)20·8
II liquor & tobacco	78·7	87·2	94·9	100·3	96·4	114·2	(+)45·1
III fuel, power, light and lubricants	96·8	106·5	114·5	115·6	117·8	121·3	(+)25·3
IV industrial raw materials	109·4	117·3	111·3	116·2	131·9	159·1	(+)45·4
raw cotton	107	113	103	102	113	111	(+)3·8
oil seeds	106	119	113	128	141	150	(+)50·9
V manufactures	102·9	106·2	107·6	108·2	116·9	129·4	(+)25·7
intermediate products	110·5	108·9	106·8	109·4	121·3	137·2	(+)24·1
finished products	101·6	105·7	107·7	108·0	116·1	128·1	(+)26·1
all commodities	98·1	105·6	105·4	112·3	118·9	127·5	(+)30·0

7. The major explanation of the continued uptrend in wholesale prices in the Second Plan period is undoubtedly the rising pressure of demand resulting from the growth of population and of money incomes. Supply factors have also played their part from time to time. In 1957-58, the production of foodgrains was 6 million tons less than in the previous year. In 1959-60, again, foodgrains production was about 4 million tons less than in the previous year. The output of cotton in that year was 18 per cent below that in the previous year; that of jute was 12 per cent lower and that of oilseeds was short by about 8 per cent. These shortfalls and fluctuations in agricultural production have reacted adversely on the price level as a whole. The level of foodgrains prices at the end of the Second Plan cannot be considered too high, but it has to be recognised that there have been large fluctuations in these prices in the course of the Second Plan period; in fact, if one compares the average level of cereal prices in 1960-61 with that in 1955-56, the rise was as large as 37 per cent. The relative stability of foodgrains prices latterly has been due largely to P.L. 480 imports.

8. As in the case of wholesale prices, the trend of the working class cost-of-living index was upward all through the Second Plan period. The index (1949=100) rose from 100 at the commencement of the Second Plan to 124 by the close of the Plan. In the earlier part of the Plan, the rise in the index was mainly because of the increase in foodgrains prices. The relative stability in these prices in the last two years has not, however, kept the cost-of-living from going up. This is because items other than foodgrains in the food group and several other elements in the cost-of-living have recorded an increase.

9. The experience of the Second Plan period reinforces the point that given a substantial investment programme, the degree to which prices can be kept relatively steady depends vitally on how far agricultural production, that is, the production of food as well as raw materials, can be increased. Industry, mining and transport have to develop rapidly if an adequate rate of growth of the economy is to be achieved. But, all this development must rest on the foundation of a more efficient and progressive agriculture. It follows that since agricultural output is subject to the vagaries of the monsoon, a programme of rapid industrialisation can be carried through without creating economic instability only if there are adequate stocks with Government to meet these periodical shortages. Moreover, agricultural prices are subject to large seasonal and regional variations, which are often aggravated by speculative hoarding. These variations have also to be moderated through judicious purchases and sales by Government.

Outlook for the Third Plan

10. The question now is as to the outlook in respect of prices for the Third Plan. Clearly, the pull of demand factors in a growing

economy must necessarily be upward. The Plan envisages a step-up in investment from the current level of 11 per cent to about 14 per cent by the end of the five year period. This will generate money incomes against which there must be an additional supply of goods. The increased volume of investment will have to be financed by fiscal measures which will involve selective price rises. The Plan postulates a large increase in savings. External assistance of a substantial order is envisaged, but it will be essential to secure an increase in domestic savings from the present level of 8·5 per cent to about 11·5 per cent in the course of the next five years. This cannot be achieved if all types of consumer demands have to be met; less essential consumption will have to be restrained so as to release resources for the investment programmes in the Plan. Moreover, the situation in respect of foreign exchange reserves is much more difficult than in the Second Plan. A part of the inflationary pressures generated by the growth of investment in the Second Plan was neutralised by the drawing down of foreign exchange reserves. This moderating factor is not available for the Third Plan. In fact, the Third Plan calls for the fullest effort to raise exports. This would tend to raise the prices of exportable commodities for the domestic consumer.

11. As to the supply side, the Plan targets for production of the basic essentials of consumption and of raw materials have been fixed on a careful examination of the likely requirements both for domestic consumption and for exports. The output of foodgrains is to be increased by over 30 per cent so as not only to meet the increase in demand because of the growth of population and incomes but also to cover the present deficit which is being met through imports. The increases in the production of rice and wheat have been planned at a higher rate to take into account the tendency for substituting superior for inferior grains as incomes rise. Production of cotton is planned to increase by 37 per cent, that of oilseeds by 38 per cent and that of sugar by 25 per cent. Provision has been made for an increase in per capita consumption of cloth from 15·5 yards in 1960-61 to 17·2 yards in 1965-66. The output of cloth from mills, powerlooms and handlooms is scheduled to go up by 25 per cent. The increase in national income that is envisaged during the Plan period leaves scope for moderate increases in per capita consumption despite the proposed step-up in investment. The fact that at the beginning of the Third Plan Government have in hand about 2·8 million tons of foodgrains and that about 14·4 million (metric) tons of wheat are expected in the next few years under P.L. 480 gives reasonable assurance that the price of wheat—and to an extent of foodgrains as a group—will not rise significantly in the next few years if the monsoons do not misbehave seriously.

12. The production potential of the country has been strengthened considerably in the last few years, both in agriculture and in industry.

The Third Plan envisages a substantial increase in the availability of fertilisers. The delays in utilisation of irrigation facilities are being reduced. Industrial production has risen impressively in recent years and, although difficulties in respect of imported raw materials and components will continue, the outlook for the Plan period is, on the whole, promising. The scheme for mobilising the financial resources required for the Plan proposes deficit financing on a strictly limited scale; every effort will be made to restrict the increase in money supply both on account of Government and of the private sector to the genuine requirements of production. Thus, the Plan has been formulated with due regard to the need for minimising inflationary pressures and for keeping a balance between the growth of essential demands and the availability of supplies to match them.

13. These balances and safeguards notwithstanding, the possibilities of significant—and even disturbing—price rises cannot be entirely eliminated. Firstly, there is the usual un-certainty in regard to monsoons. A five per cent shortfall in agricultural output in a single year can reduce the marketable surpluses substantially and raise prices more than proportionately. Secondly, the various restraints on consumption implicit in the Plan may not always operate to the full extent, so that a situation of excess demands may well persist over a part of the Plan period. Thirdly, while the Plan envisages a certain balance between the rates of growth in various sectors, some imbalance is almost certain to appear from time to time; investments and outputs in various lines cannot, in actual practice, be phased out with precision; there might well be 'lags' in the system at various stages.

14. There is, then, no doubt that it will be necessary during the Third Plan to keep a close watch on prices, especially on prices of essential commodities, and to be prepared in advance with a strategy for corrective action before difficulties actually become acute. By and large, what has to be guarded against is an upsurge of inflationary pressures, although a situation of relative abundance in respect of some commodities with consequential price falls can emerge from time to time. Measures to counteract both types of trends have to be kept in readiness. Even apart from any persistent price rises or falls, large seasonal fluctuations and regional price disparities will call for corrective action. Stable and reasonable prices for what the farmer produces are likely to provide him a better incentive than high but fluctuating and uncertain prices.

SCOPE AND LIMITS OF PRICE POLICY

15. It must be stressed that price policy has to be viewed as one aspect of overall economic policy; the question is not merely what can or ought to be done in respect of particular prices. The level and

structure of prices are related to a number of basic economic decisions some of which are taken by Government, but others rest with the producers, consumers and investors who are widely scattered and act in terms of the prospects of economic gain to themselves. A plan tries to bring these related decisions into a common focus, but there are limits to which the course of prices can be altered in the short run. Each major policy decision, such as what scale of investment to undertake, what priority to give to short-term quick-maturing investments, the choice between alternative modes of raising the resources required, raising or lowering of export quotas—all these carry with them certain implicit decisions as to the course of prices. Given these decisions, it must be recognised that the scope for altering the structure of prices is by no means unlimited.

16. Certain upward pressures on prices are implicit in development and they have to be accepted. The process of stepping up investment involves creation of money incomes ahead of the availability of goods and services. Investment adds to real national product after a time, and certain types of investment take a longer time to mature than certain others. The larger the investment effort, the greater is the upward pressure on prices. Similarly, the more long-maturing the projects undertaken, the greater is the resultant strain on the system. The substantial transfer of manpower and other resources to new uses involves payment of larger monetary rewards. This also is a significant inflationary factor.

17. There are, on the other hand, factors that tend to moderate these upward pressures. To the extent that there are unused resources that can be drawn upon and in so far as in certain sectors such as agriculture, an increase in production could be secured quickly with comparatively small investment, the expansionary pressures just mentioned may be softened. Then, again, some of the investment made earlier add to current output, and as the level of technology and organisational efficiency improve, relatively large increases in output could be secured without a proportionate increase in costs. Factors such as these have, in favourable circumstances, made it possible for certain countries to achieve high rates of growth with a fair degree of price stability. Given the requisite production and savings effort backed by an appropriate price policy, the expansionary pressures generated by development can successfully be controlled.

18. The balance between the expansionary and the moderating factors mentioned above tends, however, to be shifting and uncertain. An underdeveloped economy has to step up investments continually over a period of years and has to convert a growing proportion of unskilled rural labour into skilled workers and technicians. Various bottlenecks arise in this process of adaptation. Since the real resources needed have to be mobi-

lised through monetary incentives, and a fairly high degree of profitability secured for those sectors of the economy which have to be expanded more rapidly, it is essential to be prepared for a moderate rise in the price level, while directing every effort possible towards preventing a rise in the prices of essential commodities.

19. And yet, the dangers of continued or excessive price rises are obvious. If the financial outlays in the Plan are realised only at higher prices, the real content of the Plan gets correspondingly reduced. An inflationary situation is not conducive to the most efficient use of resources. It distorts relative prices and tends to move resources away from the uses that have higher priority from a social point of view. The fixed income earners, among whom are some of the most vulnerable classes in society, cannot be expected to put up too long with an erosion of their real standard of living, and yet, if money incomes are increased over a wide sector, the result can only be to give a further twist to the inflationary spiral. The problem, then, is one of drawing the right line between too much intervention and too little, and of devising appropriate techniques of controls and regulation at certain vital points in the system.

Constituents of Price Policy

20. A major constituent of price policy in this situation is fiscal and monetary discipline. Fiscal policy must be directed to mopping up the excess purchasing power which tends to push up demands above the level of available supplies. The quantum of taxation must, in other words, be adequate to keep down consumption to the limits provided for in the Plan. The requirements of the public sector investment programme must be met by the transfer of real resources from the public rather than by creation of fresh purchasing power. In other words, fiscal policy in all its aspects must aim at restraining consumption and mobilising savings more effectively.

21. A word may be said in this context regarding the price policy of public enterprises. These enterprises have an important role in enlarging public savings. They must, therefore, operate at a profit and maintain the high standard of efficiency required for this purpose. Their price policy should be such as would secure an adequate return on the investment made from public funds.

22. Monetary policy has to go hand in hand with fiscal policy. Just as the latter has to avoid the creation of excess purchasing power through government operations, the former has to regulate the pace of credit creation through banks. The credit needs of a developing economy are continually on the increase and have to be provided for. Care must, however, be taken to see that the scale and pace of developments in the private sector do not go out of line with those envisaged in the Plan and

thereby exert undue pressure on the limited resources available for investment. Speculative holding of commodities and accumulation of inventories need particularly to be discouraged. The policy of selective credit control followed hitherto by the Reserve Bank has latterly been supplemented by measures designed to restrict aggregate credit creation by the banks. Interest rates have gone up, and although the bank rate has not been raised, a system of penal rates on borrowings by banks beyond defined limits has been instituted by the Reserve Bank. Details of monetary management apart, the fact has to be recognised that capital in India is very scarce relatively to the demands for it, and that in the long run interest of the economy, the price to be paid for it should, save in special cases, reflect real costs. This is important both for assessing the priority to be accorded to various projects in the Plan and for determining the prices of the products or services emanating from these projects.

23. Commercial policy can also be used to an extent for overcoming domestic shortages, but since the need for several years to come is to economise on imports and to increase exports, the pressure will continually be towards an increase in domestic prices. In fact, considering the need to enlarge foreign exchange earnings, surpluses from domestic production will have to be created even at the cost of raising domestic prices. In the foreign exchange situation that the country is facing, if the choice is between an enlargement of foreign exchange earnings and a rise in the prices to be paid by the domestic consumer, the former must have a decided preference.

24. Without adequate fiscal and monetary discipline, other regulatory measures cannot have the desired effect. But, fiscal and monetary policies by themselves may also not suffice to secure the right relationship between various prices or to prevent undue hardship to low and fixed income groups. It may be necessary, then, to have physical allocations and direct controls in certain sectors. It will be agreed, for instance, that so long as steel is scarce it should be distributed between competing uses on the basis of agreed priorities. It may, of course, be essential to raise the price of any commodity that is scarce, but it may not be desirable from an overall point of view to let the highest bidder get the bulk of the available supplies leaving the rest to their own devices. If, similarly, there is a shortage of an essential drug, control of prices and distribution at a fair price to genuine users would be the appropriate course of action to adopt. The same reasoning applies to essentials of life like food or cloth. The prices of what may be called basic essentials must be held reasonably stable: in regard to commodities that are "less essential" or could be classed as comforts or luxuries, a rise in prices may have to be tolerated. In the case of comforts and luxuries, in fact, an important factor in policy is the need to raise more resources; a rise

in their prices does not affect the common man. The techniques of price regulation may vary from commodity to commodity: in some cases an increase in production may be the only way to secure reasonable levels of prices. In other cases, buffer stocks, reorganisation of distribution arrangements and some direct controls may be inescapable.

COVERAGE OF CONTROLS

25. Government have powers to control prices and make allocations in respect of several commodities. Steel, cement, raw cotton, sugar and coal are in this category. Fertiliser prices are regulated through the Central Fertiliser Pool. Stabilisation of raw jute prices through regulated purchases by the manufacturing interests is also envisaged. Both under the Essential Commodities Act and under the Industrial Development and Regulation Act, the prices and distribution of a number of commodities are subject to control. Government can also adjust the rates of excise duty from time to time on all excisable articles so as to alter suitably the relationship between particular prices. At present, these adjustments can be made only when the budget is being presented. It would be desirable to examine whether in the interest of flexibility Government should take powers to alter excise duties suitably within defined limits in the course of the year.

26. The coverage of controls on items like these and the extent to which prices may have to be adjusted upwards or downwards will have to be determined in the light of the trends in production and demand as they arise from time to time. In the case of sugar, the problem at present is one of dealing with a surplus. It may be possible to export a part of this surplus. But since the domestic cost of production of sugar is higher than the world prices, sales abroad will have to be subsidised. Over a period, the internal demand for sugar will steadily rise, and the aim of policy should be to improve yields rather than to increase the area under cane cultivation at the cost of other crops. In regard to cotton, from the point of view of the consumer, lower prices of cloth would be desirable, but it has to be borne in mind that the shortage of raw cotton has to be made good by imports which cost foreign exchange. In a situation like this, a price incentive for increased production could justifiably be preferred. In the case of oilseeds, the need is to export more at the same time as domestic demand for oils is rising rapidly. The need here is to regulate prices in the interest primarily of exports. Prices for commercial crops will need to be regulated on a consideration of all these aspects.

27. The question of appropriate price parities links up with the issue whether the grower always gets the benefit of the prices that the consumer pays, or whether his gains are intercepted by middlemen.

Whatever the normal spreads between these prices, there is no doubt that the margin between producer's price and the consumer's price tends to go up in periods of shortage. The same holds for imported commodities for which demand is in excess of the available supplies. The State Trading Corporation has sought to reduce these margins by importing some commodities in bulk and selling them to actual users. To the extent possible middlemen's margins either in respect of imported commodities or in respect of domestically produced ones should be reduced by means of trading through governmental or cooperative agencies.

Open Market Operations in Foodgrains

28. In an economy like ours where a substantial proportion of the expenditure incurred by families in the low income ranges is on foodgrains, reasonable stability of foodgrains prices is of vital importance. The experience in this field over the last decade and more has shown clearly that this is a field in which neither complete control nor complete decontrol are feasible. Government must always be in a position to regulate effectively the course of foodgrains prices. In regard to wheat, the supplies in hand and the imports expected over the next three years offer reasonable assurance of price stability except perhaps in the event of serious crop failure. The situation in regard to rice is more difficult as it will not be possible, in the event of shortage, to import adequate quantities of rice within the available foreign exchange resources. The position in regard to other cereals and pulses has always been highly variable.

29. The producer of foodgrains must get a reasonable return. The farmer, in other words, should be assured that the prices of foodgrains and the other commodities that he produces will not be allowed to fall below a reasonable minimum. The Third Five Year Plan postulates extended use of fertilisers and adoption of improved practices by the farmer. The farmer should have the necessary incentive to make these investments and to put in a larger effort. A policy designed to prevent sharp fluctuations in prices and to guarantee a certain minimum level is essential in the interest of increased production. It is important also that the appropriate measures or policies should be enunciated and announced well in time to ensure that the benefit accrues to the farmer. The other objective, no less essential, is to safeguard the interest of the consumer, and, as has been stated in earlier paragraphs, it is particularly necessary to ensure that the prices of essential commodities such as foodgrains do not rise excessively. These considerations indicate only the broad lines of policy. The key to stabilisation is the building up of buffer stocks and operating on them through continuous purchase and sales over a wide front. Since prices vary between different parts of the

country, there may be purchasing operations in some parts and selling operations in others. A major difficulty in the past has been inadequate storage facilities with Government. It is essential as part of long-range food policy that the storage and warehousing facilities, under Government's control, should be rapidly expanded. It should be known that throughout the Plan period Government would buy if prices of foodgrains tended to sag and would sell if they tended to rise. While imports have assisted and will assist for some time more in adding to the stocks with Government, it will be essential more and more to add to these stocks by domestic purchases, as production increases. Similarly, whenever or wherever in the country prices of foodgrains tend to rise, Government should be prepared to sell adequate quantities from its stocks. These open market operations need to be undertaken flexibly and at a large number of places, so that their impact is felt directly at the points where it is needed.

30. Where and to what extent zoning arrangements will be necessary will have to be determined in the light of practical considerations. Similarly, whether the purchase and sale operations should be undertaken directly by the Central Government or through the State Governments is a question on which decisions will need to be taken on pragmatic grounds. What must be assured is that Government's ability to influence the course of prices is steadily increased and this requires continuous operations over a wide front by way of purchase and sale. The level of stocks with Government from this point of view might well have to be about five million tons. A network of cooperative and governmental agencies close to the farmer, licensing and regulation of wholesale trade, extension of State trading in suitable directions and a considerable sharing by Government and cooperatives in distribution arrangements at retail stage are essential for the success of purchase and sale operations for stabilising prices and correcting seasonal and regional variations. Regulation and control of prices are in this view an aspect of the problem of institutional changes—that is, a strengthening of public and cooperative as against private agencies—that must necessarily accompany developmental planning.

31. To conclude: the Plan provides for adequate increases in the output of essential commodities to permit reasonable increase in essential consumption. The primary task is to achieve these targets. Deficiencies in this respect can be overcome only with difficulty. Fiscal and monetary policies have continually to be orientated towards restraint in consumption and maximisation of savings. The role of direct regulation and controls is essentially to correct imbalance in selected sectors and, for this purpose, buffer stocks and market operations are vital. These operations have to be directed towards keeping price fluctuations in respect of foodgrains and other basic essentials within defined maximum

and minimum limits. Price rigidity is incompatible with development and some prices cannot but rise. The object must be to regulate within defined limits the prices of basic essentials. Price regulation involves action at various points. The necessary incentives to larger production have to be preserved. It is, therefore, envisaged that Government would set up and promote the necessary cooperative and State agencies for purchase and sale of foodgrains at appropriate stages so as to strengthen its power to influence the course of prices and to prevent anti-social activities like hoarding and profiteering from getting the upper hand.

CHAPTER VIII

DEVELOPMENT OF FOREIGN TRADE

Review of Imports

Over the past decade, plans of economic development have exerted increasing influence on the country's foreign trade, in particular, on imports. With the growth of industrial production and the development of the economy as a whole, the level of imports has risen substantially over the last decade. Over the First Plan period the total imports amounted to Rs. 3620 crores or an average of Rs. 724 crores a year. In the Second Plan there was a sizeable step-up in the level of imports on account of the larger requirements of capital goods, raw materials, intermediate products, components, etc. During the first two years of the Plan imports rose sharply—from Rs. 746 crores in 1955-56 to Rs. 1099 crores in 1956-57 and to Rs. 1233 crores in 1957-58. Total imports declined in the two following years, a level of Rs. 920 crores being recorded for 1959-60. This decline in imports resulted from the tightening up of import licensing which the country had to follow in face of the foreign exchange difficulties. Imports in the last year of the Second Plan are estimated at around Rs. 1080 crores. For the Second Plan period as a whole, aggregate imports are estimated at Rs. 5360 crores—an annual average of Rs. 1072 crores, which is about 50 per cent higher than the average level for the First Plan. The following Table gives the annual average for imports of three main categories of goods during the First and the Second Plans:

Table 1: Imports 1951—61

(Rs. crores)

category	1951-56 annual average	1956-61 annual average
consumer goods	235	247
raw materials and intermediate goods	364	502
capital goods	125	323
total	724	1072

2. The Third Plan with its larger investment programme and continued priority for the development of basic and heavy capital goods

industries entails even larger import requirements than the Second Plan. Payments for imports of machinery and equipment for Plan projects are expected to amount to Rs. 1900 crores. It will be necessary, in addition, to provide for imports of components, balancing equipment, etc. of the order of at least Rs. 200 crores for increasing the domestic output of capital goods and equipment. Provision is being made for imports of raw materials, intermediate products, capital goods for replacement, essential consumer goods, etc., for the maintenance of the economy to the extent of Rs. 3650 crores, although the requirements of such imports for securing adequate utilisation of industrial capacity are considered to be distinctly larger. The total import bill for the Third Plan is thus estimated at Rs. 5750 crores in addition to P.L. 480 imports of the order of Rs. 600 crores. The average level of imports, inclusive of P.L. 480 imports, during the Third Plan period thus comes to Rs. 1270 crores, as compared with an average level of Rs. 1072 crores during the Second Plan.

3. The estimate of requirements of maintenance imports takes into account the savings in imports that are expected to arise as a result of larger outputs from projects which have already been commissioned or will be commissioned in the course of the Third Plan period. These savings also reflect the increases in the production of agricultural commodities during the Plan period. The principal savings anticipated are in respect of commodities such as raw cotton, mild steel, aluminium, various categories of machinery and transport equipment, drugs and chemicals, paper and paper-board, etc. The savings will, however, be offset in part by the larger requirements of imports of certain other categories of goods, notably, special steels, non-ferrous metals other than aluminium, petroleum products, fertilisers, etc.

In view of the difficult balance of payments position during the Third Plan period, the present system of foreign exchange budgeting and import licensing will be continued and improved upon further.

Review of Exports

4. Over the past decade, on the whole India's exports have been stagnant. The First Plan annual average of Rs. 609 crores might have been smaller but for the exceptionally high exports in 1951-52 on account of the war in Korea, while the Second Plan average of Rs. 614 crores would have been higher but for the recession in 1958 in U.S.A. and Europe. In volume, exports were higher in the Second Plan by 9 per cent but, on account of less favourable unit values, this increase was

not reflected in larger export earnings. The trends during the period 1951-52 to 1960-61 may be seen from the Table below:

Table 2: Exports 1951–61

(base 1950-51=100)

(value in Rs. crores)

year	value	volume index	unit value index	year	value	volume index	unit value index
1951-52	733	80	148	1956-57	620	101	98
1952-53	577	89	104	1957-58*	591	96	98
1953-54	531	89	96	1958-59	559	94	97
1954-55	593	94	102	1959-60	644	105	98
1955-56	609	103	94	1960-61	645	n.a.	n.a.
total	3043	..	..	total	3069	..	.
average	609	91	109	average	614	99†	98†

5. Economic development within the country increased domestic demands and reduced the surpluses available for exports. Thus, over the decade, while the total world export trade doubled, India's share in it declined from 2·1 per cent in 1950 to 1·1 per cent in 1960.

6. In the pattern of export trade over the past decade, two main trends could be observed. Firstly, among commodities which are directly or largely based on agricultural production (which still account for the bulk of India's exports) such as tea, cotton textiles, jute manufactures, hides and skins, spices and tobacco, on the whole exports did not improve. However, significant increases were achieved in the exports of new manufactures and of products like iron ore, but these were not sufficient to offset the decline in the traditional exports. These trends may be seen from the following Table:

Table 3: Pattern of exports 1951–60

(Rs. crores)

	1950-51	1955-56	1958-59	1959-60
1 agricultural commodities and related manufactures	496·5	489·3	453·5	473·6
cotton and jute manufactures (included in item 1)	250·5	181·7	153·4	180·5
2 other manufactures	58·4	61·0	53·3	105·0
new manufactured products (included in item 2)	8·9	8·6	12·5	25·0
3 minerals	23·4	34·4	46·2	53·0
total	578·3	584·7	553·0	631·6

*Net of silver exports.
†Average for four years.

Note: Statistics in Tables 2, 3 and 4 in this Chapter are based on data published by the Director General of Commercial Intelligence and Statistics.

7. In recent years and, more especially since the middle of the Second Plan period, a series of measures have been initiated with the object of stepping up exports. It is possible that but for these efforts exports during recent years might have been lower. The measures in question were fairly widely conceived and included organisational changes, increased facilities and incentives and diversification of trade. To the first group belong Export Promotion Councils, which have been set up for cotton textiles, silk and rayon, engineering goods, chemicals, tobacco, spices, cashew, leather, plastics, sports goods and mica; establishment of the Export Risks Insurance Corporation; assignment to Commodity Boards for tea, coffee and coir of the duties of Export Promotion Councils; and increased facilities for publicity, fairs, exhibitions etc. In the second group may be mentioned measures such as removal of export controls and quota restrictions, abolition of most export duties, refund of excise duties, special import licences for raw materials for exports, and priorities for transport facilities. Thirdly, through the activities of the State Trading Corporation and development of trading relations with USSR and countries in Eastern Europe, there has been progress in the diversification of India's foreign trade.

Direction of Trade

8. The following Table brings out changes in the direction of India's foreign trade during the First and Second Plan periods:

Table 4: Direction of India's foreign trade

(per cent shares)

	country/area	exports			imports		
		1952	1956	1960	1952	1956	1960
1	ECAFE countries	25·7	16·3	17·0	13·6	12·4	13·1
	Japan	4·1	4·9	5·5	2·4	5·2	5·4
2	West Asia	5·7	5·8	6.5	7·7	10·8	7·5
3	Africa	3·6	3·9	2.5	3·8	4·0	4·4
4	Western Europe	29·6	39·8	38·5	30·1	50·1	40·4
	U. K.	20·5	29·8	27·5	18·5	25·0	20·0
	European Economic Community	7·5	8·3	8·0	8·8	20·0	18.
5	Eastern Europe and China	1·3	3·5	8·0	2·2	4·2	3·7
6	North America	21·1	17·0	18·7	37·3	12·4	25·2
	U.S.A.	19·0	14·7	16·0	33·6	11·3	23·7
7	Latin America	1·4	1·0	2·5	..	0·1	0·1
8	Oceania	4·3	4·4	3·1	2·0	1·7	2·3
9	others	7·3	8·3	3·2	3·3	4.3	3·3
	total	100·0	100·0	100·0	100·0	100·0	100·0

At present Western Europe accounts for nearly 39 per cent of India's export trade, U.K. taking 28 per cent of the exports. The share of U.K.

has remained more or less constant at this level for a number of years. The share of North America declined from 21 per cent in 1952 to 17 per cent in 1956, but increased in 1960 to 19 per cent of the total exports. Exports to ECAFE countries have been relatively static in recent years. The increased exports to Japan are accounted for largely by iron ore exports.

The European Economic Community's share has fluctuated between 6·3 and 9·5 per cent over the past ten years. The share of USSR and countries in Eastern Europe has increased from about 1 per cent during the first half of the First Plan to more than 8 per cent towards the end of the Second Plan.

9. Imports from Western Europe increased during the First Plan from 30 per cent to 50 per cent; the region accounted for nearly 40 per cent of India's imports at the end of the Second Plan. Imports from Eastern Europe increased from 2·2 per cent in 1952 to 4·6 per cent in 1956, but declined to 3·7 per cent in 1960. Imports from North America, which accounted for 37 per cent of the total in 1952 declined to 12·4 per cent in 1956, but increased again to 25·7 per cent in 1960, the variation being due mainly to food imports. Imports from ECAFE countries have fluctuated between 12 to 14 per cent during this period.

Export Objectives in the Third Plan

10. If the measures for expanding exports which have been taken so far are considered in relation to the underlying factors inhibiting exports, they cannot be said to have been adequate. One of the main drawbacks in the past has been that the programme for exports has not been regarded as an integral part of the country's development effort under the Five Year Plans. If a substantial increase in exports is to be achieved, action has to be taken along several directions, in particular, the following:

(a) domestic consumption must be held within reasonable limits with a view to creating the surpluses for exports;

(b) in view of the increasing profits which can be earned in the domestic market once an economy begins to develop, steps to increase the comparative profitability of exports are essential;

(c) in their cost structure and productivity the principal industries, specially the export industries, must become competitive as early as possible, and a systematic programme to this end has to be pursued within each industry. This is an essential condition for diversifying exports and for

steadily increasing the share of new manufactures and minerals in the export trade. Industrial licensing policies should also be oriented towards export promotion; and

(d) steps must be taken to mobilise public opinion in favour of exports and acceptance of the burdens involved, to enlist the cooperation of industry and trade in this national effort, to improve Government's own organisation for market research and intelligence and commercial representation abroad, and to enlarge facilities for credit, insurance, etc.

11. The foreign exchange requirements for the Third Plan have been analysed in the Chapter on Financial Resources. It is clear that if exports over the Third Plan period do not increase significantly beyond the figure of Rs. 3450 crores indicated in the Draft Outline, even if the external aid which has been assumed were forthcoming, there would be quite serious shortfalls in the Plan. Accordingly, on the basis of commodity and other studies which have been undertaken and assuming a large-scale effort to increase exports and reasonably favourable conditions of demand abroad, exports over the Third Plan period have been taken at Rs. 3700 crores. The effort and the planning will in fact have to be distinctly larger in magnitude. An important reason for stressing new and far-reaching measures and policies for increasing exports during the Third Plan is that this is the period in which exports must be built up in order to meet the much larger requirements anticipated for the Fourth Plan. Considering the requirements on account of repayment obligations abroad and maintenance and development imports, it is estimated that by the end of the Fourth Plan the annual level of exports would have to rise to about Rs. 1300 crores to Rs. 1400 crores, that is, to at least twice the present level. This is itself one of the essential conditions for ensuring that India's economy becomes self-reliant and self-sustained by the Fifth Plan.

12. It is against this background that the objective of achieving export earnings of not less than Rs. 3700—3800 crores over the Third Plan has been set. If exports rise to the extent envisaged, the annual level of exports over the Third Plan should rise by about Rs. 200 crores and the average annual exports for the Third Plan period should be about Rs. 150 crores above the average during the Second Plan period.

Measures for Expanding Exports

13. Proposals for bringing about a marked increase in exports fall broadly under two groups, namely, general policies and measures relating to specific commodities. A number of these measures are intended to produce results over a short period of two or three years. At the same

time, other measures aiming at raising efficiency and lowering costs must be pushed forward to the farthest extent possible. The primary object of the general policies envisaged in support of the export programme is to create the necessary climate in the country for the export effort, to restrain domestic demands and enlarge surpluses available for exports, and to reduce production costs. It is realised that beyond a point action designed to increase exports will inevitably have certain repercussions on the domestic economy or on other sectors of development. Obviously, the choice is a difficult one but, having regard to the overall national interest, the highest possible priority has to be given to exports, and larger burdens within the domestic economy have to be accepted for the next 10 or 15 years as a price which must be paid for rapid economic development.

14. By far the most important condition for fulfilling the programme for exports is obviously the realisation of the agricultural and industrial targets of the Third Plan. If these were to fall short, measures which might otherwise be feasible, would become much less so.

15. Restraints on the growth of internal consumption are an essential condition of a successful export drive. They have to be resorted to where supplies are insufficient for meeting both home and foreign demands. They have also to be adopted where supplies could be increased through larger investments so as to save on internal resources as well as on foreign exchange. The rate of development of the economy would be more than proportionately enhanced through the additional exports which restraints on consumption could facilitate. As a rule, what is required is not absolute reduction in the total or the per capita consumption but only a slowing down in the rate at which consumption increases. In taking these and other measures it is of course essential that there should be greater public understanding of the need to step up exports and recognition that this object cannot be achieved without a degree of sacrifice which is equitably shared.

16. For achieving the export objectives, it is necessary not only to create the surpluses for exports, but also to ensure that the surpluses become available at prices competitive with those of other suppliers in markets abroad. Competitive export capacity depends largely on internal prices. From this point of view it is vital that inflationary pressures associated with development should be held in check.

17. For developing the export effort it is essential that a considerable part of India's industry should become much more competitive than it is at present. It is true that over a significant range of products Indian industry is capable of competing in export markets or, at any rate, of becoming reasonably competitive. However, the range of these industries

is not large enough at present. Study groups have been recently set up to consider ways of reducing costs in certain selected industries such as cement, jute, bicycles, electric motors and transformers and rayon. It is proposed to review the more important cost studies undertaken for different industries in recent years with the object of working out the lines along which programmes for cost reduction could be pursued systematically industry by industry. It is visualised that in industries which are significant for developing exports, licensing policies should take due account of the economies of scale. This factor should also be given weight in determining the location of individual units. In these industries the level of costs has over-riding importance and national interest requires that this consideration should receive precedence over certain other considerations which have normally to be kept in view in the scheme of planned development.

18. Rapidly growing internal demands have the effect of making sales in the domestic market relatively more profitable than in foreign markets. Within limits and over short periods, it may be necessary to consider fiscal measures designed to correct this trend. Naturally, details of these measures have to be considered from time to time in the light of the actual situation in different industries.

19. In view of the scarcity of foreign exchange, there has to be a clear priority in its allotment in favour of industries producing for exports or providing a substantial surplus for exports. Wherever feasible, it is hoped to work out each year in consultation with individual industries the quantities which they should endeavour to make available for exports. In some cases, to secure the surpluses indispensable for exports, it might be necessary to set physical limits to the total internal sales of individual manufacturing units, so that the rest of their production becomes available for exports. Enterprises in the public sector should also give a lead in the export effort by earmarking part of their output for export and taking suitable steps to effect sales abroad.

20. Export Promotion Councils should play a leading role in studying overseas markets and maintaining up to date intelligence. It is also hoped to strengthen the existing arrangements for enabling India's commercial representatives in foreign countries to provide adequate intelligence regarding overseas markets and to make these available to Indian industry and trade and, generally, to promote the country's foreign trade as intensively as possible.

21. Experience of State trading in recent years suggests that State trading organisations could play an important role in developing exports. Exports through cooperative organisations should be encouraged. It is also proposed to support the efforts of private export houses.

22. These are the broad lines along which it is proposed to develop the export effort for the Third Plan. Naturally, this will involve action over a wide field and decisions will have to be taken from time to time in respect of specific commodities. Some of these will involve the levy of excise duties; in others, it might be necessary to assure larger resources for development during the Third Plan. It would also be essential to try to increase invisible earnings, especially through tourism and shipping, and to facilitate foreign private investment.

23. Diversification of exports and the development of new export markets should be viewed as part of a wider effort to enlarge the country's foreign trade and expand commercial and economic relations with other countries. In the coming years special attention should be given to the development of close economic relations with other developing regions, notably South and South East Asia, West Asia, Africa, South America and West Indies. These countries will need capital goods and components and raw materials for their economic development and mutual possibilities of developing trade with them should be vigorously explored. Exports to the European Common Market countries also need special attention since a high proportion of India's trade deficit is with them. With United Kingdom, India has long enjoyed close trading ties which should be further strengthened in view of the growth of India's own productive capacity and changing economic structure. India's commercial transactions with USSR and countries in Eastern Europe are on a balancing basis and trade with these countries should increase significantly over the next few years. Trade with Yugoslavia has already expanded steadily and there is considerable scope for widening economic relations with it. North America and, in particular, U.S.A. provide about one-fourth of the country's imports. Their growing economies and high living standards offer large possibilities for the development of foreign trade and specially of exports. Thus, as the pace of India's economic progress increases and she is able both to offer and to receive more, she becomes part of an ever expanding world economy, in which growing cultural and economic relations enrich the life and strengthen the economies of all nations.

CHAPTER IX

BALANCED REGIONAL DEVELOPMENT

I

General Approach

Balanced development of different parts of the country, extension of the benefits of economic progress to the less developed regions and widespread diffusion of industry are among the major aims of planned development. Successive Five Year Plans seek to realise these aims in larger measure. Expansion of the economy and more rapid growth increase progressively the capacity to achieve a better balance between national and regional development. In striving for such a balance, certain inherent difficulties have to be met, especially in the early phases of economic development. As resources are limited, frequently advantage lies in concentrating them at those points within the economy at which the returns are likely to be favourable. As development proceeds investments are undertaken over a wider area and resources can be applied at a large number of points, thereby resulting in greater spread of benefits. In the interest of development itself, the maximum increase in national income should be achieved and resources obtained for further investment. The process is a cumulative one, each stage determining the shape of the next. In some fields, as in industry, intensive and localised development may be inevitable. Along with this, in other areas, the aim should be to provide for more dispersed advance in sectors like agriculture, small industries, power, communications and social services. Equally with industry, investment in economic and social overheads helps to create numerous promising centres for growth. Once a minimum in terms of national income and growth in different sectors is reached, without affecting the progress of the economy as a whole, it becomes possible to provide in many directions for a larger scale of development in the less developed regions. A large country with extensive natural resources, viewing each phase of its development in the perspective of a long-term plan, has the means not only to realise a high and sustained rate of growth but also to enable its less developed regions to come up to the level of the rest.

2. The two aims—increase in national income and more balanced development of different parts of the country—are thus related to one another and, step by step, it becomes possible to create conditions in which resources in terms of natural endowment, skill and capital in each region

are fully utilised. Sometimes the sense of lagging behind in development may be due not so much to a slower rate of overall growth in the region as to inadequate or tardy development in specific fields, such as, agriculture, irrigation, power or industry or employment. In each region the nature of the problem and the impediments to rapid development in particular fields should be carefully studied, and appropriate measures devised for accelerated development. The essential object should be to secure the fullest possible utilisation of the resources of each region, so that it can contribute its best to the national pool and take its due share from the benefits accruing from national development.

3. The growth potential of each region should be fully developed, but the precise manner in which this goal is achieved and the stages of growth will not be identical. Some regional factors, such as those connected with physical features and geographical location, cannot be easily altered, but there are others which can be influenced by raising levels of education and skill, developing power and, generally, by applying science and technology on a larger scale. Large scale industries, specially basic and heavy industries, frequently serve as a spearhead of intensive and broad-based development. However, not all regions can offer equally favourable conditions for the development of industry. It is also possible to over-estimate the significance of the location of large industrial units in relation to the living standards of the bulk of the population. There are many examples, both of countries and of regions within a country, in which, with limited development in industry, an appreciable rise in living standards has been achieved through the fuller utilisation of local natural and human resources. There are also instances of areas around massive projects where no great impact on the levels of living of the people is to be observed. Apart from the basic and capital goods industries and other large industries, there are other industries whose possibilities need to be fully explored, such as labour intensive industries of the traditional type, small scale industries of the modern type, agricultural processing industries, forest industries, assembly operations and recreational industries. Each region should endeavour to identify, plan for and promote industries which are specially suited to its conditions and for which it can provide relatively greater facilities.

II

Policies for Regional Growth

4. The general approach set out above was expressed through a variety of policies and programmes which were embodied in the Second Five Year Plan. Among the most important of these were:

(1) the priority given to programmes like agriculture, community development, irrigation, specially minor irrigation, local

development works, etc. which spread over the entire area within the shortest possible time;

(2) provision of facilities such as power, water supply, transport and communications, training institutions, etc. in areas which were lagging behind industrially or where there was greater need for providing opportunities for employment:

(3) programmes for the expansion of village and small industries; and

(4) in the location of new enterprises, whether public or private, consideration given to the need for developing a balanced economy in different parts of the country. In particular, this aspect was to be kept in view where the location of an industry was not determined almost entirely by the availability of raw materials or other natural resources.

In addition to these measures, the Second Plan envisaged an effort to promote greater mobility of labour between different parts of the country and to organise schemes of migration and settlement from more to less densely populated areas. The Plan also suggested that there should be continuous study of the problem of regional disparities and suitable indicators of regional development should be evolved.

5. In drawing up and implementing the Second Plan, the regional aspects of development were dealt with in three different ways. Firstly, through the plans of States emphasis was given to programmes which had a direct bearing on the welfare of the people in different parts of the country. Secondly, special programmes were undertaken in particular areas where development had either received a temporary setback, or was being held back by certain basic deficiencies. In the third place, steps were taken to secure more dispersed development of industry which, in turn, creates conditions for development in several related fields.

6. Programmes of agriculture, community development, village and small industries, irrigation and power, communications and social services have the widest coverage, and aim at providing basic facilities and services to people in all regions. Since these programmes are included in the plans of States, it is largely through the shape given to State plans and the changes through which they pass in the course of the Plan period that the benefits of development are carried to every part of the country. River valley projects formed a most important segment in the plans of several States and large investments have been made in multi-purpose projects like the Hirakud, Kosi, Chambal, Rihand, D.V.C., Bhakra-

Nangal, Koyna and Nagarjunasagar. These and other projects were essential for the development of vast regions in the country, some of which suffered from scarcity or unemployment or were otherwise poorly developed. Implementation of agricultural production and community development programmes, and of education and health schemes also carried the benefits of development to the remotest areas.

7. In addition to these general or overall programmes of development, both in the First and the Second Plan, special schemes were formulated for particular areas which had difficult problems to face. Thus, in 1953-54 a programme of permanent improvements in scarcity areas was taken in hand in several States at a total cost of about Rs. 40 crores. The programme included medium as well as minor irrigation schemes, construction of embankments for flood protection and land reclamation and contour bunding schemes. Again, in 1957, when scarcity conditions developed in some States, the problem was studied and additional development programmes were taken up. For less developed areas situated in different States, such as, Vidharba and Marathwada, the eastern districts and other backward areas in Uttar Pradesh and hill areas in Punjab and Uttar Pradesh, the States concerned have frequently provided for special outlays within their plans, and have made special arrangements for the representatives of such areas to participate in making their own plans. In States like Madhya Pradesh, Orissa and Assam, additional programmes have been undertaken in areas inhabited by backward classes. These include roads and communications, multi-purpose development blocks, forest cooperative societies, and measures to improve upon the existing systems of shifting cultivation. A study of the problems of inaccessible areas in different States has also been undertaken by the Ministry of Food and Agriculture.

8. As regards the diffusion of industrial activity, so far as the larger industries are concerned, economic and technical considerations are always important and in practice only marginal deviations are feasible. The disadvantages which particular areas may have for the location of the larger projects are not always basic or irremediable, for, at times they may reflect only the lack of basic facilities and services. In the location of public sector projects, the claims of relatively backward areas have been kept in view wherever this could be done without giving up essential technical and economic criteria. The location of several important projects like the steel plants has been determined on the basis of expert study and on economic considerations. But as they are situated in areas which were hitherto industrially backward, the latter will benefit. Similarly, schemes for the development of certain natural resources such as lignite deposits in Arcot, iron ore in Orissa, bauxite deposits in Salem and lead

and zinc deposits in Rajasthan will benefit areas which have been relatively less developed.

9. While, in the selection of sites for basic capital and producer goods industries, proximity to raw materials and other economic considerations have naturally been important, it was felt that in a wide range of consumer goods and processing industries it was possible to foster regional patterns of development. These include cotton textiles, sugar, light engineering industries such as bicycles, sewing machines, electric motors, radio receivers, re-rolling of steel and non-ferrous metals from billets and semis, moulded plastics and manufacture and further processing of bulk drugs from penultimate products. Typical examples are the establishment of textile units in Rajasthan, Orissa, Assam and Punjab; sugar factories and distilleries in Andhra Pradesh, Madras, Mysore and Maharashtra; steel re-rolling mills in Assam, Madhya Pradesh, Kerala and North Bihar and tyre and tubes factory and electric lamps factory in Kerala. In the case of light engineering industries, the decision to sell steel at a uniform price at all rail-heads is an important step taken during the Second Plan for securing their wider dispersal. The policy followed regarding the licensing of new units in the sugar industry has assisted development in the peninsula. Similarly, new cotton textile mills have been encouraged to come up in areas in which the industry had not so far developed.

10. To some extent the development of new processes and new uses of raw materials has assisted in the spread of industry. Thus, a beginning was made with the use of bagasse as a raw material for paper, and a number of paper factories based on the use of bagasse have been approved for being set up in sugarcane growing areas. In Uttar Pradesh a synthetic rubber plant is being established on the basis of alcohol, which was formerly being used mainly for admixture with petrol. A decision has been taken to license pig iron plants, each up to a capacity of about 100,000 tons, in areas where non-metallurgical coals locally available could be used, if necessary, along with coke produced from metallurgical coal. Besides increasing the production of pig iron this will ensure dispersal of the industry. In encouraging such developments care has of course to be taken to ensure that a balance is maintained between regional distribution and considerations of economy in production.

11. Village and small industries are spread all over the country and various forms of assistance provided by the Central and State Governments are made available in the areas according to the programmes which are undertaken. Industrial estates have been set up in all States, and increasingly they are to be located in the smaller towns and rural areas.

III

Regional Possibilities in the Third Plan

12. With development on a scale larger and more comprehensive than in the recent past, the Third Plan provides extensive opportunity for the development of different parts of the country. Some of the most important programmes in the Plan fall necessarily within the plans of States. In drawing up these plans, the broad objectives have been to enable each State to contribute its best towards increasing agricultural production. to secure the largest measure of increase in income and employment feasible, to develop social services, in particular, elementary education, water supply and sanitation, and health services in the rural areas, and to raise the levels of living for the less developed areas. Thus, State plans are intended to be oriented towards greater production and employment and the welfare of weaker sections of the population. Every effort has been made to propose outlays for different States after considering their needs and problems, past progress and lags in development, specially in social services, communications and power, likely contribution to the achievement of major national targets, and potential for growth, as well as the contribution in resources which they could themselves make towards the financing of their plans. In assessing the needs and problems of different States, such factors as population, area, pressure on cultivated land, commitments carried over from the Second Plan and those arising from large projects, and the state of technical and administrative services available have been taken into account. Thus, as far as possible, an attempt has been made to consider both national and State priorities. Taken as a whole, the size and pattern of outlays in the States under the Third Plan are calculated to reduce disparities of development between different States. although, in the nature of things, this is a process which must take time.

13. In addition to the role assigned to the plans of States, there are several important features in the Third Plan which will enlarge the possibilities of development in areas which have in the past been relatively backward. Thus, for instance, the intensive development of agriculture, extension of irrigation, village and small industries, large-scale expansion of power, development of roads and road transport, provision for universal education for the age-group 6—11 years and larger opportunities for secondary, technical and vocational education, improvements in conditions of living and water supply, and programmes for the welfare of scheduled tribes and castes and other backward classes will go a long way to provide throughout the country the foundations for rapid economic development. Poverty and under-employment are specially acute in areas with heavy pressure of population and in those with scanty development of natural resources. The large programme of rural works, which it is

proposed to undertake during the Third Plan, will help expand opportunities for work in these as well as other areas. In some parts of the country, there will be considerable development in plantation industries, specially tea, coffee and rubber. Large industrial projects, river valley projects and others described later will also serve as vital centres for future growth.

14. *Industrial location and development areas.*—As explained earlier, for basic industries location has generally to be based on technical and economic considerations. Moreover, in the case of industries which may be able to export a significant proportion of their output, in the national interest the location of new or additional capacity has to be guided by the need to secure economies of scale and to enhance the ability to compete in foreign markets. But, subject to these broad considerations, the needs of areas which have the necessary potential for industrial development should be kept in view in the selection of sites for industrial projects both in the public and the private sector. The general approach has to be to avoid further concentration of industrial activity in areas where considerable development has already taken place or has been planned, but expansion in existing industries in such areas cannot, of course, be ruled out if it leads to greater economies in production. Similarly, as far as possible, care must be taken to set up new industries away from large and congested cities.

15. From decisions regarding location of projects in the public sector which have been reached so far, it is apparent that there will be a fair measure of dispersal and various regions will have a significant share in industrial development. As examples the following may be cited: expansion of the Rourkela steel plant and fertiliser factory in Orissa; Nunmati oil refinery, fertiliser plant and use and distribution of natural gas in Assam; phyto-chemical plant, expansion in fertiliser capacity and construction of a shipyard in Kerala; the synthetic drugs factory, Visakhapatnam dry dock and expansion of Hindustan Shipyard, Praga Tools and the Andhra Paper Mills in Andhra Pradesh; the security paper mill, basic refractories project and expansion of Nepa mills, the Bhilai steel plant and the Heavy Electrical Project in Madhya Pradesh; the antibiotics factory, fertiliser factory, refractories plant and expansion of precision instruments factories in Uttar Pradesh; development of copper deposits in Rajasthan; a machine tool factory in Punjab; surgical instruments plant, raw film project, pilot iron and steel plant, Neiveli lignite high temperature carbonisation plant, teleprinter factory and a steel rolling mill in Madras; oil refinery in Gujarat; and a cement factory in Jammu and Kashmir.

16. In the licensing of industrial projects in the private sector also, the claims of under-developed regions are kept in view and locations in

such areas are suggested to prospective industrialists. The progress, programmes and production targets of a number of industries in the private sector are examined from time to time with a view to securing the location of new capacity on a zonal basis. It is recognised that in future there should be even greater stress in these directions. For example, it is proposed that the new textile mills to be established in the Third Plan period should, by and large, be distributed in regions where at present there is little capacity. Similar studies have been conducted in respect of some of the light engineering industries. Among illustrations of important projects in the private sector which are expected to be set up during the Third Plan in the less developed regions may be mentioned an aluminium plant and cellulose acetate factory in Uttar Pradesh; a fertiliser factory, a nylon factory, caustic soda-P.V.C. factory and a zinc smelter in Rajasthan; synthetic rubber, polythylene and carbon black projects and paper pulp factory in Assam; and an automobile rubber tyre factory and expansion of several existing plants in Kerala.

17. The Industrial Policy Resolution visualised that facilities such as power, water supply and transport should be made available in areas which are at present lagging behind industrially or where there is greater need for providing opportunities for employment, so that suitable industries could be established there. To give effect to this suggestion, the Third Plan includes a proposal for setting up 'industrial development areas' in backward regions. In such regions in selected areas basic facilities like power, water and communications are to be provided, and factory sites developed and offered for sale or on long lease to prospective entrepreneurs. The scheme has been drawn up primarily to promote medium-sized industries, but it is anticipated that, along with these, there will be wider scope for establishing small-scale industries, specially those of an ancillary character. It should also be possible to establish industrial estates within or in proximity to the proposed industrial development areas. The scheme has been broadly accepted by States and specific proposals are being worked out.

18. *Large projects as nuclei of regional growth.*—The benefits of a large project accrue in greater measure to the population of the region in which it is located if certain related or complementary programmes and schemes are undertaken. Therefore, as an essential feature of planning, every major project should be regarded as a nucleus for integrated development of the region as a whole. Around the new irrigation projects for instance, a whole group of schemes aiming at the development of improved agriculture, horticulture, market centres and processing and other industries should be taken up. Similarly, steel plants and other large industrial projects provide the basis for the development of small and medium industries and programmes of education and training and other activities. Such possibilities of development exist in all large

regions in which new resources will be developed during the Third Plan, such as, Dandakaranya, the Rajasthan canal area, and the regions served by the Tungabhadra, Nagarjunasagar, Koyna, Chambal and several other projects. Problems of a somewhat different kind are posed by the growth of metropolitan cities and of large and growing cities. In metropolitan regions like Calcutta, Delhi, Bombay or others, it is necessary to pursue a series of programmes aiming at balanced regional development, including appropriate land and housing policies, establishment of new towns and decisions regarding the location of industries. Thus, in different types of regions the preparation of regional or area development plans should be undertaken at an early stage in the Third Plan. In this way, the benefits flowing from the location of new and vital centres of activity or the creation of new sources of wealth can be greatly increased and far more widely distributed.

19. *Role of technological developments.*—Development potentials of different regions need to be studied in relation to the possibilities which arise from advances in technology and science. For example, the handicaps of certain regions such as Assam, Gujarat and Rajasthan arising from lack of deposits of coal may be materially reduced as hydel power, oil and atomic energy become available. From a long-term point of view, this factor is of great importance in regional development. Similarly, improvements in transport and communications are already bringing distant regions nearer, as for instance in the case of Assam, Jammu and Kashmir and parts of Orissa, Madhya Pradesh and Rajasthan, and making it possible for them to share more fully in the general economic advance. Increase in the supply of electric power and the extension of rural electrification are important factors in opening up new possibilities of regional development. Several of the less developed areas in the country will register considerable progress in these directions during the Third Plan.

20. *Education and training.*—In areas which are less developed, lags in education are among the greatest handicaps in achieving rapid economic progress. Expansion of the general educational base through the programmes of free and compulsory primary education and provision of facilities for technical training is likely to make a steadily increasing contribution to the development of the less advanced regions. Financial provisions for these programmes have been made in the plans of States, but it is necessary to ensure that the resources earmarked for the development of primary education in the less developed areas and for the education of girls are effectively utilised. Facilities for the training of engineers, doctors, agricultural specialists, craftsmen and others are already being distributed throughout the country. The requirements of the population of relatively less developed areas in which new industrial projects may be located should be particularly borne in mind when programmes for technical, vocational and secondary education are implemented.

21. *Labour mobility.*—In some parts of the country, there has been for long considerable mobility of labour. For instance, labour from Bihar works in the tea plantations in Assam and labour from Rajasthan works on roads and irrigation projects in Punjab and elsewhere. The redeployment machinery set up at the Centre and in the States for different areas assists movement of skilled personnel to new projects. The question of migration and mobility of labour is of course a wider one. The scope for transferring large numbers of unskilled workers from the more densely to the less densely populated parts of the country may at present be relatively limited. However, it is apparent that skilled and semi-skilled workers can move from one area to another with much less difficulty and are absorbed more readily wherever the local economy is developing rapidly. It is, therefore, necessary that in areas of high density, besides assuring their own intensive development to as great an extent as possible, technical training programmes should be expanded considerably, so that a body of trained workers also become available for work elsewhere.

22. *Personnel for development.*—The level of development depends to a considerable extent on the availability of competent administrative and technical personnel and on the growth of a class of small and medium-sized entrepreneurs who are prepared to venture into new fields and take risks and more generally, on the development of local initiative and leadership. Attention should be given to these aspects of development, for they point to handicaps which cannot be removed merely by providing resources to an under-developed region.

IV

Studies in Regional Development

23. Continuous study of economic trends and rates of growth in different areas and of the programmes bearing on the less developed regions is useful in formulating programmes for more balanced regional development. Under-developed areas which need special attention have to be more closely identified, their resources surveyed and the factors influencing their development examined. The concept of a 'region' also needs to be defined more clearly. There are regions within States as well as those which extend beyond them and, depending upon the purpose in view, different concepts may be employed. Within every State, there are areas which are more under developed than others. As explained earlier, problems of regional development also arise in a variety of other contexts, as for instance, in areas around major projects, areas where new resources are being developed, and metropolitan regions. For assessing levels of development in different regions, indicators of development based on agricultural production, industrial production, investment, unemployment, electricity consumption, irrigated area, value of output by commodity producing sectors, level of consumption expenditure, road mileage, primary

and secondary education and occupational distribution of population, are useful, but they must be compiled on the basis of accurate statistical data and should be strictly comparable for different States or regions. Some work on these problems was done during the Second Plan, and it is proposed to continue it with the help of a special study group with which the Central Statistical Organisation, State Statistical Bureaus and the Indian Statistical Institute will be associated.

24. As a comprehensive indicator of economic progress estimates of 'State income' are of considerable interest in studies of development in different States and regions. There are complex questions connected with concepts, definitions and techniques of estimation of 'State' and 'regional' income, and these have a bearing on the practical value of various estimates. 'State income' may be considered either as the income originating within the boundaries of a State or as income accruing to its residents. The first concept corresponds to the 'domestic product' for the country as a whole, and the second to 'national income.' For a comparative study of the level of industrial and economic development among the States or regions, it is sufficient to have an estimate of income originating within the 'State' or 'region'. The estimates of income accruing to a State, on the other hand, may serve as a broad measure of the economic welfare of the residents of the State as a whole. In view of the importance of estimates of State income in future Plans, it has been agreed that the Central Statistical Organisation should undertake, in cooperation with State Statistical Bureaus, the task of preparing estimates of State income on a comparable annual basis. These estimates will have to be prepared on the basis of commodity production and income originating. Estimates of income in certain commodity sectors such as agriculture, industry, etc. on a comparable basis may be taken up in the first instance.

25. While estimates of State and regional income and compilation of data in respect of selected indicators would be useful, it is even more important to carry out systematic surveys for identifying the problems of different regions and assessing their needs and potentialities. Scientific and technical surveys in various fields are undertaken by agencies such as the Geological Survey of India, the Bureau of Mines, the Oil and Natural Gas Commission, the Central Water and Power Commission, the Indian Council of Agricultural Research, the Council of Scientific and Industrial Research and others. Techno-economic surveys of several States and Union Territories have been undertaken by the National Council of Applied Economic Research. The survey of the Damodar Valley region by the Institute of Technology, Kharagpur, and the universities of Calcutta and Patna, has reached an advanced stage. The Indian Statistical Institute has undertaken regional surveys in Mysore and Kerala as part of its scheme of study of the problems of regional planning. The benchmark surveys and other studies of the Programme Evaluation Organisation and the Agro-Economic Research Centres provide information regarding

the problems of rural areas at various stages of development. The city surveys and other studies organised under the auspices of the Research Programmes Committee offer valuable data bearing on urban and regional development problems. Surveys of metropolitan regions like Delhi and Bombay and those proposed for Calcutta have also considerable importance for planning. Thus, as a result of several steps which have been taken in recent years, a wide range of technical, economic and social data regarding the problems and possibilities of regional development have become available, and will assist planning for the future.

26. Development of regions and of the national economy as a whole have to be viewed as parts of a single process. The progress of the national economy will be reflected in the rate of growth realised by different regions and, in turn, greater development of resources in the regions must contribute towards accelerating the rate of progress for the country as a whole. Excessive emphasis on the problems of particular regions and attempts to plan for their development without relating their needs to the requirements of the national economy have to be guarded against, for, in the final analysis, it is as integral parts of the country that different regions can best hope to realise their full potential for growth. Balanced regional growth emerges eventually from a whole series of connected developments, many of which are of a long-term character. Over the short period, advance towards the goal will frequently seem small and incomplete. This is true for individual regions and, equally, for the national economy as a whole. Whatever the present shortcomings, the aim must be that over a reasonable period all regions in the country should realise their potential for economic development and should attain levels of living not far removed from those of the nation as a whole. Progress in different regions must, therefore, be watched carefully, and additional steps taken to speed up development in particular areas which are found to be seriously lagging behind. In the perspective of long-term development, with the economy advancing rapidly towards the stage of self-sustained growth and with steady rise in the living standards of the people, regional and national development are essentially two different facets of a common objective.

CHAPTER X

EMPLOYMENT AND MANPOWER

I

ANALYSIS OF THE PROBLEM

EMPLOYMENT has been a major objective of planning in India; it was so in the first two Plans and has assumed a special urgency in the Third. Full utilisation of the available manpower resources can be achieved after a considerable period of development. However, expansion of employment opportunities commensurate with the increase in the labour force over the Plan period is conceived as one of the principal aims of the Third Plan. In view of the numbers involved, provision of adequate employment opportunities is among the most difficult tasks to be accomplished during the next five years.

2. In the rural areas, both unemployment and under-employment exist side by side; the distinction between them is by no means sharp. In the villages, unemployment ordinarily takes the form of under-employment. In many parts of the country, during the busy agricultural seasons, shortages of labour are frequently reported, but over the greater part of the year, a large proportion of agricultural labour and others engaged in allied activities are without continuous employment. The consequent drift of workers from villages to towns only serves to shift the focus of attention from rural areas to the urban. Though recent surveys show a somewhat higher rate of unemployment in the towns, this itself is a reflection of the lack of adequate work opportunities in rural areas. Urban and rural unemployment in fact constitute an indivisible problem.

In the urban areas, employment is linked with fluctuations in the state of business, transport and industry. Any change in conditions is reflected in an increase or decrease in employment figures. While this is generally true, towns—large and small—share with villages a measure of distress caused by under-employment.

3. The existing data are inadequate for building up a sufficiently detailed picture of the state of employment for the country as a whole and in its regional, urban and rural aspects. But statistics apart, there is a general belief, which is strengthened by the limited number of employment opportunities reported to the employment exchanges and the

pressure of employment seekers on them, that in terms of unemployment the economy suffered significant deterioration in the last five years. The high rate of growth of population, as reflected by the limited 1961 Census data, now available, would indicate that the problem is one of increasing complexity. This has been broadly confirmed by the findings of the Second Agricultural Labour Enquiry, the National Sample Survey and the studies undertaken by the Programme Evaluation Organisation. This, however, is not a complete statement. Development programmes have provided additional employment opportunities to a significant extent; but these are not being created fast enough to absorb the numbers who enter the labour force each year. If any further deterioration in the employment situation is to be avoided, the goal of planning must be to absorb in gainful employment in each five-year period at least the equivalent of new entrants to the labour force.

4. It is not easy to measure unemployment in an under-developed country. There is a tendency, specially among the self-employed, to share work between members of the family or the group. Where the available work opportunities are spread too thinly even to provide tolerable means of livelihood, a part of the population migrates in search of paid employment. It is in relation to this section of the population that the term "unemployed" can be used with some exactness. For the rest, one can only speak of under-employment for varying periods. An important factor in planning for larger employment within the present occupational structure is that, for lack of employment opportunities, a considerable proportion of self-employed persons have to function below capacity and do much less work than in fact they are willing to. Statistics about under-employment depend very much on how the term is defined. At the present stage of development, it is difficult to determine the volume of under-employment with reference to 'norms' of hours per day to be worked by individuals or other similar criteria. It is more meaningful to judge the amount of under-employment by the extent of additional work an individual may be willing to take up. This is the concept which has been adopted in the more recent rounds of the National Sample Survey.

5. The limited data at present available may be considered in relation to the following aspects of the employment problem; (a) numbers unemployed at the end of the Second Plan, (b) addition to the labour force during the Third Plan, and (c) assessment of additional employment likely to be secured through the implementation of the Plan as formulated. It is also necessary to take into account such measures as would help to step up the employment effect of development schemes with a significant labour component, such as construction and small industries. Even if the full employment potential of the Plan is achieved, it will be necessary to think of special employment programmes to cover the residual employment gap.

6. In the course of the Second Plan the additional employment opportunities created amounted to about 8 million, of which about 6·5 million were outside agriculture. The backlog of unemployment at the end of the Second Plan is reckoned at 9 million. This estimate is admittedly rough. It takes account of the estimate of unemployment as at the beginning of the Second Plan (5·3 million), the larger increase in labour force during the Second Plan period than had been visualised earlier (1·7 million), and the estimated shortfall in the employment target originally proposed for the Second Plan (about 2 million). In addition, under-employment in the sense of those who have some work but are willing to take up additional work cannot be precisely estimated, but is believed to be of the order of 15—18 million.

7. Increase in the labour force during a given period is calculated with reference to the proportion of men and women in the age group 15—59 years who are estimated as being gainfully employed or seeking employment. In the Draft Outline of the Third Plan, the increase in labour force had been worked out at 15 million, and it was pointed out that, if deterioration in the employment situation was to be avoided, additional employment opportunities of this order would have to be found during the Third Plan. Information for the 1961 Census regarding the age composition of the population and changes in the extent of participation in the labour force by men and women is not yet available and, at this stage, certain general assumptions on these aspects have to be made on the basis of the latest reports of the National Sample Survey. On such estimates as are at present possible, it appears that during the Third Plan the addition to the labour force may be of the order of 17 million, about a third of the increase being in the urban areas. When fuller data become available, it will be necessary to work out the increase in the labour force in relation to different States, so that each State may endeavour to realise the employment potential of programmes and projects under the Plan and consider the extent to which these could be supplemented by other measures. In a growing economy, mobility of labour, specially among skilled workers, is of great importance and should be encouraged and facilitated. However, in relation to the numbers involved, the effects of such mobility as can be achieved in the next few years will be necessarily limited and will not affect the total size of the task to be undertaken in each State or region.

8. The employment objectives of the Third Plan need to be viewed in the perspective of a longer period. Increase in the labour force over the next 15 years may be of the order of 70 million. This consists roughly of about 17 million in the Third Plan, about 23 million in the Fourth and about 30 million in the Fifth Plan. The experience of the first two Plans has shown that a larger proportion of the employment opportunities

generated during the period have gone to the non-agricultural sector. On the assumption that this trend will continue in future and also that about two-thirds of the increase in the labour force over the next 15 years is absorbed outside agriculture, it should be possible to reduce the proportion of the working force dependent on agriculture to around 60 per cent by 1976.

II

Additional Employment in the Third Plan

9. There are inherent difficulties in estimating the employment potential of the vast range of projects and programmes which form part of a plan of development stretching over a period of five years. In each sector of the Plan two major assumptions have to be made. The first is that through appropriate economic and other policies, production and employment will not be allowed to fall below the existing levels. Secondly, the various development programmes for which the Plan provides will be undertaken with the necessary efficiency and economy and continuity of output would be assured. In some fields, as in agriculture and trade, it is specially difficult to estimate the likely additional employment. Increase in agricultural production, to which the Plan devotes a fair share of resources, will lead primarily to reduction in under-employment, although there will also be a measure of net increase in employment opportunities. In less developed countries, the numbers engaged in trade are large, in relation to the work they are required to handle, so that the effect of expansion in the trading sector is more to reduce under-employment than to provide additional work opportunities to new entrants.

10. In industry, increase in investment and capacity does not lead to a proportionate growth of employment because new processes, specially in large-scale manufacture, have generally to be based on high productivity techniques. The choice of techniques becomes, thus, a matter of crucial importance for employment policy. In certain branches of industry, it is essential to adopt the scale and methods of production which will yield the largest economies. This has to be balanced by a deliberate effort in other fields to employ techniques which will be more labour-intensive and will save on capital resources, specially foreign exchange. Labour intensive methods have even wider application in the field of construction in which, given the necessary organisation and advance planning, it is posssible to use manpower to a greater extent than has been common in recent years. What techniques should be adopted have to be determined not only according to the types of activities to be carried out, but also by the economic and social characteristics of the regions in which they are undertaken. In areas in which there is considerable pressure of population, special care must be taken to follow methods which, consistent with the overall objectives, make the maximum use of the available manpower resources.

11. In estimating the employment effects of the Plan, it is usual to distinguish two phases of employment—the construction phase and the continuing phase. Employment on construction, though temporary, postulates a certain order of investment even for maintaining it at a given level. Increase in construction employment can, therefore, be estimated with reference to the increase in investment over the previous Plan period. Since investment in construction is divided broadly between the labour component on the one hand, and machines, materials and services on the other, for working out the additional employment, the former has to be calculated with some precision.

12. In estimating continuing employment in fields such as agriculture, irrigation, industry, transport, social services, trade, etc., a variety of criteria have to be followed. For instance, development of agriculture, afforestation and irrigation facilities may in part reduce under-employment and in part provide full-time employment to new entrants. It is by no means easy to ascertain the relative share of the benefits to the under-employed and to new entrants. Programmes of development like soil conservation, afforestation, land reclamation, flood control, settlement on land and the utilisation of irrigation facilities will provide means for employing new entrants to the labour force in addition to giving greater employment to those who are already at work. For this purpose certain norms have been adopted on the basis of experience accumulated over the last ten years.

13. In estimating additional employment in industries, depending upon their character, employment may have to be related either to the investment or to increase in levels of production after allowing for rise in productivity in some cases; in others, reliance has to be placed on project reports and on information supplied to the Licensing Committee. In road transport, the criterion may be furnished by different indicators of increase in the volume of passenger and goods traffic. In the field of social services a variety of tests have to be adopted, depending upon the level at which the Plan intends to provide these services to the community. For instance, in health services, the requirements of different types of personnel were assessed in relation to the population served. In education, the pupil-teacher ratio was used as the criterion.

14. Apart from the direct employment flowing from different development programmes, account has also to be taken of indirect employment in such fields as trade, commerce and transport. In the Second Plan, indirect employment was reckoned at 52 per cent of the additional employment which could be attributed to development programmes under the Plan, both in the public and the private sectors. On the basis of recent studies it would be reasonable to assume for the Third Plan, indirect employment benefits at 56 per cent of the additional em-

ployment attributable to development programmes in the Plan. Finally, certain checks have to be applied to estimates of additional employment worked out for different sectors. Gradually, fuller data for such overall appraisal are becoming available. These include the results of special surveys and investigations, project studies, employment market information gathered by the National Employment Service, and analysis of information provided in applications submitted for industrial licenses. Estimation of employment in relation to a plan of development involves a number of assumptions, which have to be continuously tested. In the nature of things, therefore, there can be no finality in estimates of employment which might be worked out in relation to a plan of development. Experience of the last ten years shows that there is need for continuous examination and improvement of methods and for assessment of the actual performance in relation to initial estimates of employment and investment. To facilitate this, a detailed statement of the assumptions made in calculating the additional employment potential of the Third Plan is given in Appendix C.

15. Following the methods of estimation explained above, it is reckoned that the Third Plan may provide additional non-agricultural employment of the order of 10.5 million and additional employment in agriculture of about 3.5 million. The additional non-agricultural employment is distributed broadly as follows:

Additional non-agricultural employment

(in lakhs)

sector	additional employment in the Third Plan
1 construction*	23·00
2 irrigation and power	1·00
3 railways	1·40
4 other transport and communications	8·80
5 industries and minerals	7·50
6 small industries	9·00
7 forestry, fisheries and allied services	7·20
8 education	5·90
9 health	1·40
10 other social services	0·80
11 government service	1·50
total (1 to 11)	67·50
12 'others' including trade and commerce at 56 per cent of total (1 to 11)	37·80
grand total	105·30

*Since construction accounts for a large portion of the measureable employment, its break-up under different developmental sectors may be useful:

agriculture and community development	6·10
irrigation and power	4·90
industries and minerals, including cottage and small industries	4·60
transport and communications, including railways	3·40
social services	3·50
miscellaneous	0·50
total	23·00

16. Besides additional employment outside agriculture and in agriculture described above, there will also be significant relief to under-employment, but it is difficult to indicate its extent in quantitative terms. In agriculture, only about a fourth of new employment potentialities have been taken account of for estimating additional employment and the remaining are expected to provide relief to under-employed persons. In village and small-scale industries, only full-time jobs have been accounted for in the table above. While the economy seeks to absorb as many workers as possible into non-agricultural occupations, during the Third Plan it is expected that there will be a net addition to the total number of workers engaged in agriculture. A large part of the increase in the labour force will take place in families who are at present dependent on agriculture. If employment opportunties do not develop sufficiently in the non-agricultural sectors, under-employment in agriculture will be further intensified, leading to lowering of living standards in a section of the community upon whom the growth in population has already borne harshly. It should also be stated that in the nature of things, estimates of additional employment arising from the Plan are subject to a considerable degree of uncertainty. If some of the assumptions made are not borne out by later experience, or if the various programmes and projects are not implemented in a sufficiently effective and continuous manner, the additional employment estimated above may not be fully realised.

17. If, in consequence of Plan programmes, employment opportunities are available for about 14 million persons, leaving aside the backlog of unemployment, even for providing work for the new entrants to the labour force, there is need to find additional employment opportunities for 3 million persons. This is considered to be an essential objective in the Third Plan.

At this stage it must be emphasised that although the validity of quantitative estimates is affected by the inadequacy and complexity of employment data, experience in the First and Second Plans show that employment targets could not be achieved in full because of shortfalls in performance in various sectors of the Plan. Every attempt has, therefore, to be made to avoid the recurrence of such a situation.

It is proposed that the problem should be approached along three main directions. Firstly, within the framework of the Plan, efforts should be made to ensure that the employment effects are spread out more widely and evenly than in the past. Secondly, a fairly large programme of rural industrialisation should be undertaken with special emphasis on programmes of rural electrification, development of rural industrial estates, promotion of village industries, and effective re-deploy-

ment of manpower. Even though, in the first instance, the introduction of new production techniques may result in a decrease in employment, it is expected that there will be significant long-term benefits in revitalising the rural economy. Thirdly, in addition to other measures for increasing employment through small industries, it is proposed to organise a rural works programme, which will provide work for an average of say, 100 days in the year for about 2·5 million persons and, if possible, more. These programmes, and specially the proposal for rural works, will assist the general mass of the population and will also provide increased opportunities for the educated unemployed. The latter have, however, certain special problems of their own, which are briefly discussed in a later section of this chapter.

III

EMPLOYMENT AND PLAN IMPLEMENTATION

18. From studies which have been undertaken, there is reason to believe that there are several ways in which it might be possible to secure larger gains in employment from the development programmes which are undertaken than has been the experience in recent years. It is common to analyse the problem of unemployment in terms of the country as a whole or in relation to large territories such as States. Sufficient attention has not been given to the possibilities of making a larger impact on the employment problem at the district and block levels. Every district has development programmes relating to agriculture, irrigation, power, village and small industries, communications and social services. These programmes are intended to raise the level of economic activity of the district and to increase production generally. Besides the direct employment they provide, many of the programmes are intended to stimulate individual farmers, artisans and small entrepreneurs and cooperatives to extend their activities and, in the process, provide additional employment. If full advantage is taken of these programmes and they are carefully adapted to the local needs, it should be possible to realise greater employment benefits at the district and local level. The unemployment problem in each State should, therefore, be broken down by districts, and at each level—village, block or district—as much of it as possible should be tackled. Such an analysis of local employment problems would enable the authorities to focus attention on and to raise resources for dealing with specific employment aspects, e.g. unemployed artisans and agricultural labourers, educated unemployed, etc. Since the problems in different areas are necessarily different, the employment approach at the area level will have to be worked out with a certain measure of flexibility to suit local conditions and resources.

19. The severity of employment problems makes it necessary to re-examine the scope that exists in individual construction projects for the increasing utilisation of manual labour. In the usual course, machinery is utilised in construction in cases where mechanisation would lead to considerable economies in terms of reducing costs and in shortening the construction period. It is necessary to emphasise on all project authorities that where mechanisation does not lead to significant economies preference must be given to labour–intensive methods of construction. These considerations should be kept firmly in mind at the time of preparing project reports and, wherever machinery is chosen in preference to men, convincing reasons should be given for such a choice. In fact, it is recommended that a standing committee of senior officers should be appointed to examine all such decisions from the employment angle.

20. In areas with heavy pressure of population, where even a large programme of development, such as must be undertaken still leaves a residue of unemployed, substantial numbers of persons should be imparted suitable skills and given opportunities of work in areas where these skills are not locally available in sufficient measures. It is proposed to undertake a few pilot schemes on these lines with a view to evolving the necessary techniques and organisation.

21. Although much has been done in recent years to promote village and small industries, a larger employment potential in this field still remains to be secured. In village and small industries, it is not enough to relate employment benefits to the new developments which are proposed to be undertaken. Much the greater part of the increase in employment has to be secured by realising the full potential of the existing small enterprises. For small-scale units of the modern variety, frequently the limiting factor is not the demand for the products as their ability to produce the quantities needed. This is specially true of industries requiring raw materials such as iron and steel, non-ferrous metals, yarn, chemicals including dyes, and others. In some cases, the lack of processing and other facilities may be a handicap. Almost everywhere, artisans and small entrepreneurs are not able to secure the credit facilities needed and do not have dependable facilities for the marketing of goods. Special efforts should, therefore, be made to enable small units (whether run by cooperatives of artisans or by individual entrepreneurs) to attain their maximum production potential.

22. Rural industrialisation and rural electrification are, in fact, connected programmes and are of the greatest importance for the expansion of stable employment opportunities in rural areas. It is necessary to develop centres or nuclei of industrial development in each area and link these with one another through improved transport and other facilities. These centres might be in small towns or in centrally

situated villages which are able to attract skills and enterprise and to which power and other facilities could be more readily provided. The Third Plan provides for a large programme of rural electrification. For rural electrification to make the necessary contribution to the growth of production and employment, there is need in each district for forward planning, both in the supply of power and for its utilisation. It is essential that the programme for agricultural and industrial development should be co-ordinated with the supply of power. Greater concentration of activity at selected points would bring about improvements in the load factor.

IV

UTILISATION OF RURAL MANPOWER

23. The proposal to undertake a comprehensive programme of rural works during the Third Plan, to which a reference has been made earlier, is significant not merely for creating the additional employment opportunities which are required, but even more as an important means for harnessing the large manpower resources available in rural areas for the rapid economic development of the country. During the Third Plan, agricultural production has to increase twice as fast as it did over the past decade. This calls for intensive and concentrated effort involving the participation of millions of families in programmes of agricultural development. For many years the greatest scope for utilising manpower resources in rural areas will lie in programmes of agricultural development, road development projects, village housing and provision of rural amenities. A lasting solution of the problem of under-employment will require not only the universal adoption of scientific agriculture but also the diversification and strengthening of the rural economic structure. Programmes for developing village and small industries, linking up the economy of villages with the growing urban centres, setting up processing industries on a co-operative basis, and carrying new industries into rural areas form part of the Third Plan and have to be further intensified. These programmes will be aided by the spread of rural electrification. While the rural economy is being thus built up, there is need for comprehensive works programmes in all rural areas, and more especially in those in which there is heavy pressure of population on land and considerable unemployment and under-employment.

24. Works programme envisaged for rural areas comprises five categories of works:

I. Works projects included in the plans of States and local bodies which involve the use of unskilled and semi-skilled labour;

II. Works undertaken by the community or by the beneficiaries in accordance with the obligations laid down by law;

III. Development works towards which local people contribute labour while some measure of assistance is given by Government;

IV. Schemes to enable village communities to build up remunerative assets; and

V. Supplementary works programmes to be organised in areas in which there is high incidence of unemployment.

Schemes under categories II, III and IV mentioned above are intended to be undertaken as a vital feature in the normal plans of development in rural areas. They are intended to ensure fuller utilisation of the manpower, and will also provide some, though necessarily limited, wage-employment. Wage-employment on a large scale has to be found in the main through works falling within categories I and V. Works in these two categories are in fact identical in nature, the main consideration being that category V will include supplementary schemes over and above those in category I. Thus, for the additional programme of rural works envisaged in the Third Plan, two main groups of schemes involving considerable use of unskilled and semi-skilled labour will have to be undertaken namely (a) local works at the block and village level and (b) larger works requiring technical supervision and planning by departments.

25. For local works as well as for the larger schemes it is essential that there should be clearly worked out programmes in each development block. The block plan will include all the works to be undertaken by different agencies through the block organisation such as programmes included in the schematic budget under the community development scheme, and those falling within the general plans of the States under agriculture, animal husbandry and cooperation, programmes for large and medium irrigation projects, road development etc.. In turn, the block plan must be split into village plans and, in this form it should be made widely known in the area. For projects like irrigation, soil conservation, road development etc. to provide the maximum employment to the people in each area, it is necessary that they should be carried out in close cooperation with the local block organisation. Since unemployment and under-employment are specially acute during the slack agricultural seasons, to the extent possible, works programmes should be planned for execution during these periods. In all cases of works to be undertaken in villages, wages should be paid at the village rates.

26. Following broadly the lines mentioned above, a scheme of pilot projects for works programmes for utilising rural manpower has been recently introduced, and 34 pilot projects have been so far taken in hand. The scheme of pilot projects provides for certain supplementary works programmes to be undertaken in addition to agriculture, irrigation, road

development and other programmes included in the State plans and the community development programmes. As a rough measure, a provision of Rs. 2 lakhs was suggested for each project for the period ending March, 1962. The pilot projects which have been begun include schemes for irrigation, afforestation, soil conservation, drainage, land reclamation and improvement of communications. The object of this series of pilot projects is to furnish experience in organising works programmes which will make some impact on the problem of unemployment and under-employment.

27. On the basis of the initial experience gained in the pilot projects, it is hoped to extend the programme on a mass scale to other areas, specially to those with heavy pressure of population and chronic under-employment. Tentatively, it is envisaged that employment through the works programmes should be found for about 100,000 persons in the first year, about 400,000 to 500,000 persons in the second year, about a million in the third year, rising to about 2·5 million in the last year of the Plan. Limited financial provision for the early phases of the programme has been made in the Third Plan. It is reckoned that the programme as a whole might entail a total outlay of the order of Rs. 150 crores over the Plan period. As the programme develops, it might be possible to consider ways of paying wages in part in the form of food-grains. It is proposed that the necessary construction organisations and the labour cooperatives needed, should be built up, specially at the block level. These organisations can carry stocks of tools, obtain contracts, secure the necessary technical and administrative assistance, organise cadres of trained and skilled workers, and work in close cooperation with district authorities, panchayat samitis and others. Voluntary organisations should also be able to provide local leadership and undertake educational and cultural work. To carry out the rural works programmes on the scale suggested above, adequate organisations are to be built up mainly in the States and also, to the extent necessary at the Centre.

V

Educated Unemployed

28. The rapid pace of industrialisation during the last ten years has been accompanied by significant changes in the occupational structure of industrial employment. Industry now recruits persons who would formerly have been absorbed in 'white-collar' employment. Newer industries like iron and steel, chemicals, petroleum refining, general and electrical engineering, rubber tyres, aluminium, etc., are being developed relatively faster than older industries such as cotton textiles, jute and tea. The older industries, in turn, with an eye on meeting competition in the international market, have introduced schemes of rationalisation. Expansion programmes in industries, such as iron and steel, chemicals,

etc., involve the application of the latest and most efficient production techniques and, consequently, require a more technically qualified group of operatives. Increasing mechanisation in coal mining also requires personnel of a higher calibre than the older type of recruits in that industry. These developments may be expected to lead to larger employment opportunities for the educated. In judging the future prospects for the educated, this changing nature of the industrial scene has to be constantly kept in mind, and also the fact that attitudes to manual work are also undergoing marked change. The educational system will have to be geared to meet the rapidly changing pattern of personnel requirements. Manpower studies have been undertaken in a number of selected fields and arrangements have been made to suitably expand the existing facilities for technical education and to open new institutions, where necessary. It is expected that adequate facilities for practical in-plant training will be available in the wake of the apprenticeship legislation, now under consideration. Programmes of vocational guidance have been developed during the last 5 years, as part of the National Employment Service.

29. With the expansion of education at the secondary level, greater attention should be given to the absorption of educated persons into gainful employment. The problem of the educated unemployed may be considered in two parts—the backlog and the new entrants. The precise magnitude of the backlog is difficult to ascertain, but on the assumption that a constant proportion of the educated unemployed would have registered at employment exchanges, their total number might be estimated at nearly a million. The number of new entrants who have studied upto the school leaving standard or above, is estimated at about 3 million. Expansion in agriculture, industry and transport will provide a large and increasing demand for persons with skill and vocational or technical training. Reorganisation of the system of education and provision of facilities for technical and vocational education are, therefore, of paramount importance. In recent years, there has been a change in the attitude towards manual work on the part of educated persons, and programmes for orienting them to the requirements of the developing economy can be taken up on a larger scale than was hitherto feasible. A beginning in this direction was made during the Second Plan through the setting up of a number of orientation and training centres, and it is proposed to undertake a more broad-based programme during the Third Plan.

30. A significant proportion of educated persons registered as unemployed have had education ranging from the middle courses in schools to the first or second year at college. Young men belonging to this group cannot find adequate openings in urban areas unless they obtain technical training of some kind or other, and at best they can be absorbed to a

limited extent and in relatively low paid occupations. In the immediate future, it is in rural areas and through rural programmes that large employment opportunities for the educated unemployed are likely to become available. The rural works programme will itself make a large demand for persons with education, and it is proposed that as a preparatory step numbers of educated persons should be selected and put through short periods of training for specific jobs of work. The scope for regular and continuous employment within the rural economy will greatly increase with the development of co-operatives for credit, marketing and farming, growth of processing industries, development of scientific agriculture and the establishment of democratic institutions at the district, block and village level. It should also be possible to assist fairly large numbers of young persons with education to set up small industries at rural centres at which power can be made available. As far as possible, these industries should be organised on a co-operative basis, so that the necessary financial and technical guidance can be provided and the marketing of products organised. As the rural economy develops and the co-operative sector in it becomes larger, there will be increasing opportunity for employment at levels of income which are comparable in real terms with those available in the towns. Development along these lines has the additional advantage that rural areas will retain the services and the leadership of their own educated youth to a far greater extent than is now possible.

31. A brief reference may be made here to the need for re-deployment of skilled personnel from projects which have been completed or are nearing completion to those on which construction is to commence. It has been observed that irrigation and power projects as well as industrial projects have been obliged at times to retrench experienced labour when the construction programmes were not sufficiently dovetailed to take over labour from one project to another. During the Second Plan, the necessary machinery for this purpose has been created and has functioned satisfactorily. If work on similar projects is better phased and advance planning is undertaken, the size of the problem to be dealt with would be more manageable.

CHAPTER XI

PERSONNEL REQUIREMENTS AND TRAINING PROGRAMMES

I

Manpower Planning

Of all the resources for development, perhaps the most fundamental at the present time is trained manpower. Owing to the rapid advance in science and technology and the growing complexity of industrial and economic organisation, there is increasing demand for larger numbers of highly skilled and trained personnel drawn from different disciplines and functioning generally in composite teams rather than as individuals. As the economy develops, the requirements of individuals with more advanced and specialised training and of scientifically trained workers increase, while the need for persons at lower levels of skill and for the semi-skilled and unskilled steadily diminishes. It takes five years or more to give the basic training needed by an engineer or a doctor, and a much longer period to provide research and practical experience essential for filling positions of greater responsibility. To secure the required outturn of scientific and technical personnel and build up an adequate foundation of scientific research may take a nation, a whole generation.

2. In relation to the long-term economic development of a country, the extent of trained manpower available and the training facilities established constitute a major determinant of the measure of advance which can be achieved in different directions. As the economy grows, there has to be emphasis not only on numbers but also on quality and experience. Problems of producing the requisite trained manpower have to be seen in their broader context. On the one hand, they bear upon the character of education at each stage in school and college and on life in the home; on the other, they encompass the entire system of management and organisation in industrial and other undertakings, and the lines along which research is undertaken and its results applied.

3. In the context of programmes for the training of manpower, the demands of rapid economic development are like those of a national emergency. It calls for the reorganisation and expansion of existing institutions, development of large numbers of new institutions, special measures for obtaining and training teachers and instructors, introduction of new techniques for intensifying training and shortening the periods needed, expanding facilities for imparting practical training, and developing

new ways of making use of trained personnel as a scarce key resource. In the light of experience and assessment of the developing needs of the economy there must be constant re-examination of ideas and practices in vogue in the field of training. In manpower planning the economy has to be viewed as a whole, the entire range of facilities and possiblities available in all undertakings, whether public or private, being deemed to be at the service of the community. There is need to encourage experiment and innovation on the part of every organisation and training institution and to provide ever-increasing opportunities for original and creative activity.

4. Over the first two Plans valuable experience in manpower planning has been gained in several fields. There has been considerable expansion in facilities for the training of scientists, engineers and technologists, of agricultural, veterinary and health and medical personnel and of skilled craftsmen. Steel plants and other major industrial projects have made it necessary to take up large-scale training, both within the country and abroad, and in this other nations have also generously shared their experience and facilities. Trained personnel are required in large numbers, not only for the development of industry and transport and power but also in many other fields. Rural development programmes undertaken in community development and other areas have already involved large training programmes. As the role of democratic institutions at the district, block and village levels, of the cooperative movement, of municipal bodies and of voluntary organisations becomes more decisive in fields close to the welfare of the community as a whole, their need for trained personnel will become even more marked and much larger numbers of trained workers will be needed. Progress in education, health services, family planning and welfare programmes, as envisaged in the Third and later Plans, will also depend to no small extent on the adequate supply of teachers and other trained personnel.

5. In each field personnel requirements have to be estimated carefully and over a long period. This calls for improved statistical information, and development of techniques of manpower assessment so that the necessary estimates can be made with reasonable accuracy and a comprehensive picture built up for the economy as a whole. Estimates of personnel requirements have necessarily to be reviewed from time to time in the light of changing needs and experience. Manpower planning is, thus, an integral part of the economic plans formulated by the Central and State Governments and their agencies, and, within their own specific fields by industrial associations and other organisations representing different activities or interests as well as by individual undertakings and institutions, both public and private. They call for constant interchange of knowledge and experience and for special investigations. In view of the wide range of issues to be considered, and the

great importance of manpower planning for the country's future development, it is proposed shortly to set up an Institute of Applied Manpower Research, which will work in close collaboration with the Central and State Governments and with industrial and other organisations. Among the main aims of the Institute will be to provide a broad perspective of requirements of trained manpower for economic development in different fields, arrange for facilities for advanced training in manpower planning, develop methods for training and building up the existing work-force, evolve methods for identifying and developing talented persons and, generally, secure the most effective utilisation of the country's human resources.

6. As compared to the First Plan, the Second Plan presented problems of manpower planning on a much larger scale. To a considerable extent, profiting from the lessons of the Second Plan, steps were taken sufficiently in advance to secure trained personnel for the Third Plan. In many fields, though by no means in all, training programmes, which form part of the Third Plan, are designed to produce trained workers for the still more intensive development envisaged in the Fourth and later plans. There are still large areas in which personnel with adequate experience will not be available in sufficient number, and small numbers of trained and experienced persons will have to carry a disproportionate load. In these fields, while making the maximum use of the available indigenous personnel, there should be no hesitation in taking advantage of technical assistance programmes and other sources for obtaining such highly trained personnel as may be needed. Since the requirements of personnel are commonly reckoned chiefly in terms of assumptions and possibilities, based on past or current experience and unforeseen demands will continue to be thrown up on account of the rapid technological changes within the country and abroad and the growing needs of the economy, the present estimates are likely to need upward revision. It will be of particular importance during the Third Plan to reassess requirements in different fields from time to time and to take a view of these requirements not merely for the Fourth Plan, but also for the Fifth Plan. In this Chapter it is proposed to set out briefly the present estimates of requirements of personnel and the training programmes for which the Third Plan provides in such fields as engineering, technology and science, agriculture and rural development, education, health and social welfare, and statistics and administration.

II

ENGINEERING, TECHNOLOGY AND SCIENCE

7. Requirements of engineers and technicians may be considered at three principal levels—graduates, diploma holders and skilled craftsmen. In each group there has been rapid increase in the additions needed during each Plan period. On present estimates 51,000 additional engineer-

ing graduates are likely to be required for the Third Plan as compared to about 29,000 in the Second Plan; the demand in the Fourth Plan is estimated at about 80,000. Estimates for different branches of engineering are given in the Table below:

Table 1: Estimated additional requirements for graduates in engineering and technology

	Second Plan	Third Plan	Fourth Plan
civil engineering	12400	13000	20000
mechanical engineering	5300	15300	24000
electrical engineering	5600	10500	17000
telecommunication engineering	1600	2500	4000
chemical engineering	2300	3500	7000
metallurgy	700	1100	1600
mining	500	1600	2400
others*	1000	3500	4000
total	29400	51000	80000

8. The additional requirements of diploma holders in engineering and technology in the Third Plan are estimated at about 100,000 compared to about 56,000 in the Second Plan; estimates for the Fourth Plan are at present placed at about 125,000. The break-up of the additions needed by different branches of engineering is shown in the following Table:

Table 2: Estimated additional requirements of diploma holders in engineering and technology

	Second Plan	Third Plan	Fourth Plan
civil engineering	29000	39000	48000
mechanical engineering	12200	26000	33500
electrical engineering	10400	18000	22500
telecommunication engineering	600	600	800
chemical engineering†	800	3500	5000
metallurgy	200	1100	1300
mining	600	4000	5000
others*	2000	7800	8900
total	55800	100000	125000

*Includes sugar technologists, jute technologists, leather technologists, architects and town planners, automobile, aeronautical, marine, public health and sanitary, and agricultural engineering personnel.

†Training at the diploma level is provided by sandwich courses at training centres for chemical operators.

9. With the stepping up of industrial development in the Third Plan and developments visualised for the Fourth Plan, the requirements of mechanical, electrical and chemical engineers will increase relatively faster than those of civil engineers. There will also be greater need for training specialists in branches like mining, metallurgy and other technologies. These changing trends will be taken into account while determining the distribution of the additional facilities for engineering education which are now being provided. In the course of the Third Plan the admission capacity of engineering colleges will increase from 13,860 at the end of the Second Plan to 19,140, the corresponding increase in polytechnics being from 25,570 to 37,390. Provision is also being made for part time and correspondence courses in engineering and technology. Estimates of requirements and out-turn of engineering personnel for the Third and Fourth Plans are indicated in the Table below:

Table 3: Estimated additional requirements and outturn of engineering personnel

	Second Plan		Third Plan		Fourth Plan	
	requirement	outturn	requirement	outturn	requirement	outturn
graduates	29000	26000	51000	51000	80000	80000
diploma holders	56000	32000	100000	82000	125000	127000

The shortage of diploma holders, which has been considerable during the Second Plan, will not be altogether made up in the Third Plan. The present plans need to be reviewed further from this aspect and in the light of more detailed information regarding the requirements of engineering personnel for major industrial programmes which is likely to become available as programmes are worked out. Estimates for the Fourth Plan are provisional and will be studied in greater detail with reference to the possibilities of long-term economic development indicated in Chapter II.

10. *Craftsmen.*—The requirements for craftsmen during the Third Plan are estimated at nearly 1·3 million, about 810,000 being in engineering trades and the rest in non-engineering trades. Several industries as well as establishments under the Railways, Posts and Telegraphs, Defence, etc., have their own training programmes. A proportion of skilled and semi-skilled workers are also trained through traditional methods, the skills being imparted from father to son. Facilities for institutional training at centres maintained by State Governments in collaboration with the Ministry of Labour & Employment, are, thus, required for a much smaller number. The number of industrial training institutes and centres has increased from 59 in 1955-56 to 167 in 1960-61, and the Third Plan provides for a further addition of 151. The intake capacity increased cor-

respondingly from 10,500 in 1955-56 to 42,000 at the end of the Second Plan, and will increase further during the Third Plan to 100,000. The apprenticeship training scheme, which was to be implemented by industry on a voluntary basis with a measure of support from Government, did not make much progress during the Second Plan. Legislation will be shortly introduced for placing apprenticeship on a compulsory basis. The programme for evening classes for industrial workers will also be extended.

11. *Inservice training programmes.*—Over the Second Plan inservice training programmes have been introduced by a large number of organisations, both public and private. These will be further enlarged. Thus, the major industrial enterprises have set up their own training schools, and some of them have also provided facilities for apprenticeship training. For the training of personnel at higher levels, the National Laboratories, the Atomic Energy Commission, the Ministry of Irrigation and Power, the Meteorological Department and others have arranged for special facilities.

12. *Scientific personnel.*—The National Register for Scientific and Technical Personnel maintained by the Council of Scientific and Industrial Research, carries about 106,000 registrations of whom Indians abroad account for nearly 5000. Of the number registered with the Council, about 33,000 are post-graduates in science subjects or graduates in agriculture, and about 66,000 are engineers and technologists both at the degree and diploma levels, the rest being specialists in medical profession. It is estimated that the coverage in the National Register is about 80 per cent of the total number of scientists. The "Scientists Pool" which has been maintained by the Council of Scientific and Industrial Research for the last three years for providing temporary placements for highly qualified scientists and others, especially those returning to India from foreign countries so far assisted the selection of 653 scientists and technologists. The following Table brings out the position of post-graduate scientists in India:

Table 4: Estimated additional scientific personnel

	total numbers in position in 1955	additional personnel in Second Plan
Mathematics and Statistics	5700	6300
Physics	4600	2200
Chemistry	7300	1700
Botany	2100	1400
Zoology	2300	1400
Geology	1300	1200
total	23300	14200

13. Enduring foundations for expansion of scientific education can be laid only through the provision of larger facilities for science education both in the secondary schools and at the university stage. The demand for scientists comes from many different directions—science teachers, maintenance engineers, research scientists, etc. Out of 27,000 teachers required for colleges in the Third Plan, as many as 17,000 will be scientists. There has been marked increase in facilities for science education in universities as may be seen from the following Table:

Table 5: Facilities for science education—enrolment

degree	1950-51	1955-56	1960-61
Bachelor of Science	32600	52300	84000
Master of Science	3800	6500	11300
Doctorate	630	1120	2000
total	37030	59920	97300

By the end of the Third Plan, science as an elective subject will be available in 9,500 secondary schools out of a total of 21,800 and at the university stage facilities will be provided for additional enrolment of about 230,000 students in science out of a total of about 400,000 students.

The need for scientists for fundamental and applied research and employment of scientists in other fields will have to be reviewed continuously during the Third Plan and increase in facilities considered in the light of such estimates.

III

AGRICULTURE AND RURAL DEVELOPMENT

14. Programmes in agriculture and allied fields of development in the Third Plan entail a very considerable expansion in personnel. The necessary training facilities were developed to a large extent during the Second Plan, so that in most fields the demands at present anticipated are expected to be met with only a small increase in the facilities available. However, the possibility of the total demands under different heads increasing as the Plan proceeds has to be kept in view. Tables 6 and 7 below show the additional requirements of agricultural and allied personnel during the Third and Fourth Plans as at present estimated and the programme for expanding training facilities during the Third Plan:

Table 6: Estimated additional requirements of agricultural and allied personnel

	numbers in position in 1960-61	Third Plan additional requirements	Fourth Plan additional requirements
agricultural graduates	14000	20000	30000
veterinary graduates	5000	6800	7000
dairy technologists			
degree	52	625	1150
diploma	308	975	1150
forestry			
forest officers	1100	480	600
rangers	3000	1520	1900
fisheries			
administrative and statistical personnel	460	1475	2410
fishery engineers	150	240	
fishing boat personnel	120	250	
technical shore personnel	50	170	

Table 7: Additional training facilities in the Third Plan

	1960-61			1965-66		
	institutions	intake	outturn	institutions	intake	outturn
agriculture colleges	53	4600	2300	57	6200	4500
veterinary colleges	17	1300	1200	19	1460	1350
dairy technological institutions	5	110	100	7	170	154
fisheries institutes	2	50	50	3	80	75

15. *Agriculture.*—Besides the addition of 4 new agricultural colleges during the Third Plan, post-graduate courses are to be established in 5 existing agricultural colleges. For the training of farmers' sons, on the lines of the vocational agricultural school at Manjri in Maharashtra, 50 new institutions are to be set up. During the Second Plan an Agricultural University was established in Uttar Pradesh, and further proposals for setting up a few other Agricultural Universities are at present being examined. Agricultural Universities aim at bringing together a number of related fields of study, such as agriculture, animal husbandry, veterinary science, dairying, basic sciences and humanities, and at integrating teaching with research and extension work. To secure an adequate supply of qualified teachers for agricultural colleges, training wings are proposed to be set up at selected institutions. A Staff College for agricultural personnel in the senior and middle grades

is also to be established. The scheme of post-graduate fellowships will be extended during the Third Plan.

16. *Animal husbandry and veterinary science.*—Facilities for post-graduate education in veterinary science are to be developed at Izatnagar. To provide training in extension methods in animal husbandry, extension wings are to be attached to all veterinary colleges with provision for practical training at livestock demonstration farms.

17. *Dairying.*—Dairy development is a relatively new field in which only small numbers of trained persons are at present available. Facilities for training at the diploma level exist at Anand, Bangalore, Bombay, Karnal and Naini. They will also be developed at Haringhata in West Bengal. The Agricultural Research Institute at Anand will be developed into a degree college. Dairy technologists are being trained at the Central College of Dairying at Karnal. Short-term inservice training programmes as well as courses in dairying for the Master's degree and special refresher courses are to be organised at the National Dairy Research Institute.

18. *Forestry.*—In recent years there has been appreciable increase in training facilities for forest officers at Dehradun and for rangers both at Dehradun and at Coimbatore. The training facilities at the existing institutions will be augmented further with a view to meeting increased demand on account of Third Plan programmes.

19. *Fisheries.*—During the Third Plan, a Central Institute of Fisheries Education will be established at Bombay for providing training in all aspects of fisheries, including extension, statistics, marketing, etc. An institute of fisheries operatives will also be set up at Cochin. The existing Central Institutes for Inland Fisheries at Calcutta and for Marine Fisheries at Mandapam will be expanded.

20. *Soil conservation.*—In relation to the large soil conservation programme included in the Third Plan, the existing training facilities will need to be substantially strengthened, especially for extension personnel and field workers. The Plan at present provides for doubling the intake capacity of the training centre at Dehradun from 30 to 60, and increase in the capacity of the four existing research-cum-training centres at Kotah, Hazaribagh, Ootacamund and Bellary from 240 to 400. Some of the agricultural colleges also have plans for providing training in soil conservation.

21. *Community development.*—By October, 1963, the community development programme will have been introduced throughout the country. The programme now serves 3100 development blocks out of a total of about 5000. Having regard to the shortages existing at the end

of the Second Plan in certain categories, estimates of requirements for the Third Plan are as follows:

Table 8: Estimated additional requirements of personnel for community development programmes*

		number
gram sevaks (village level workers)		21689
gram sevikas (women village level workers)		7869
extension officers		
	agriculture	2081
	cooperation	2648
	animal husbandry	3494
	rural industries	3712
	panchayats	3677
overseers		2915
social education organisers		
	men	1868
	women	3741

With the introduction of Panchayati Raj, arrangements for the training of non-officials at training institutes, training camps, seminars, etc. are being developed further.

22. *Cooperation*.—In the course of the Second Plan, there has been considerable expansion in the facilities for training in cooperation. In 1960, there were in all 62 institutions for training junior cooperative personnel, 13 institutions for intermediate grades of personnel, and a college at Poona for senior personnel. For training non-officials in the cooperative movement, including office bearers and members of cooperative societies, 368 training units were sponsored by the All-India Cooperative Union. The training programmes for the Third Plan are described in the Chapter on Cooperation.

IV

EDUCATION, HEALTH AND SOCIAL WELFARE

23. *Education*.—The programme for education in the Third Plan involves an increase of about 61 per cent in the number of trained teachers in primary schools about 81 per cent in middle schools and about 40 per cent in secondary schools. With the completion of this programme, the proportion of trained teachers in each of these categories will rise only to about 75 per cent. Facilities for formal training are, therefore, being supplemented by further arrangements for refresher courses and inservice training.

24. Throughout the Second Plan there has been considerable shortage of teachers in science and in crafts. Four regional colleges are being established during the Third Plan with the object specially of training teachers in science and in special subjects. In universities and colleges also there

*Exclusive of Block Development Officers and health personnel.

will be a large demand for science teachers. It is reckoned that of about 27,000 additional teachers in colleges required during the Third Plan, about 17,000 will be for science. Similarly, the expansion of technical education in the Third Plan will call for as many as 9000 additional teachers for engineering colleges and polytechnics. Various emergency and short-term measures are being taken to meet shortages of teachers until sufficient numbers become available in the ordinary course, but the situation is likely to remain difficult throughout the Third Plan, and, in some fields, greater use could be made of part-time and other professional personnel.

25. Facilities for training instructors in crafts for industrial training institutes and centres have been greatly expanded during the Second Plan. There are at present four central training institutes with a total capacity of about 550. The capacity of these institutes will now be increased to over 1000 and along with the three new institutes, which it is proposed to set up, the total capacity will increase to about 1800, outturn during the Plan period being about 8000.

26. *Health and medical personnel.*—For carrying out the Third Plan programmes, health and medical personnel, specially in ancillary categories such as nurses, midwives and health visitors will fall short of requirements. In Table 9 below proposals for increase in training facilities during the Third Plan are set out along with the position existing at the end of the Second Plan.

Table 9: Additional training facilities for health and medical personnel

		1960-61			1965-66	
	institutions	intake	outturn	institutions	intake	outturn
doctors . . .	57	5800	3200	75	8000	4830
nurses . . .	250	4000	2800	350	6200	4500
auxilliary nurse-mid-wives/midwives .	420	5200	4000	550	9100	7000
health visitors. .	30	650	375	50	850	500
sanitary inspectors .	28	2250	2250	38	2850	2850
pharmacists . .	10	550	480	15	1450	1270

In addition to the programmes above, the Plan also provides for increase in admissions each year to dental colleges from 280 to 400. Four new dental colleges will be set up and 10 existing institutions expanded. A problem which calls both for the rapid expansion of post-graduate education and for various short-term measures, is the shortage of teachers in medical colleges which is at present estimated at about 2000 and is likely to increase further.

27. *Family planning.*—Another important field in which it is urgen to secure additional personnel is family planning. To make family planning services available much more widely than at present, it is essential to provide the necessary family planning services at primary health centres. Large numbers of women workers and others have to be recruited and trained. The programmes which have been drawn up are likely to be inadequate and should be considered further.

28. *Social welfare.*—In welfare programmes such as are undertaken in community development blocks, tribal development blocks and welfare extension projects, frequently there are shortages of trained women workers. Welfare work among women and children, particularly in rural areas, has to be undertaken in the face of obvious difficulties, and workers have to be specially selected and trained. For attracting a sufficient number of women to take up such vocations as those of gram sevikas, nurses, health visitors, teachers and child welfare workers (bal sevikas) special attention should be given to working conditions, provision of residential accommodation, facilities for transport and opportunities for work with voluntary organisations like mahila mandals.

V

ADMINISTRATION, STATISTICS AND TECHNICAL ASSISTANCE

29. *Administrative services.*—The requirements of administrative personnel have increased steadily in recent years. It is indeed inevitable that each Plan should not only lead to substantial increase in the numbers needed, but should also place challenging burdens and responsibilities on the administrative as well as technical services. Thus, over the past decade, the authorised strength of the Indian Administrative Service has risen from about 1200 to well over 2000. In the Third Plan, the net additional requirements for the Indian Administrative Service are estimated at 400. Much larger increases are to be expected in the State Administrative Services whose responsibilities have already grown and will increase further with the development of Panchayati Raj institutions. The requirements of administrative personnel at different levels in the States are at present being studied. Along with these, a review is being undertaken of the existing arrangements for training and supervision and other aspects on which the quality of administrative personnel depends to a large extent.

30. Facilities for the training of administrators have been developed at the National Academy of Administration at Mussoorie, the Administrative Staff College at Hyderabad and the Indian Institute of Public Administration in Delhi. Some State Governments have set up their own institutions for the training of the State administrative and executive services. To assist personnel engaged in development in the States it is also proposed to work out a programme for training in the field of economic and social planning. It is proposed to establish two All-India Insti-

tutes of Management for the training of higher managerial personnel required for industrial undertakings, both in the public and in the private sectors.

31. *Statistical personnel.*—There has been considerable expansion in the demand for personnel with statistical training. Over the period of the Second Plan, the number of persons with statistical training and background employed with the Central and State Governments has increased from about 4000 to 10,000. The additional requirements for the Third Plan are estimated at about 6000. There will also be increased requirements in private industry and commerce. The Indian Statistical Institute at Calcutta, which is an 'institution of national importance' under the Act passed by Parliament in 1959, has introduced a four-year course for the degree of Bachelor of Statistics and a further two-year course for the degree of Master of Statistics. The Institute also provides for specialised professional courses and for post-graduate research degrees. The Central Statistical Organisation conducts inservice training courses for statistical officers working in the Central Ministries and in the States at senior and intermediate levels and also for junior Government personnel, besides imparting training in official statistics to batches of students from the Indian Statistical Institute. Training courses in their special fields are being provided by the Institute of Agricultural Statistics, the All-India Institute of Hygiene and Public Health, the Ministry of Education and the Forest Research Institute, Dehradun. State Statistical Bureaus arrange courses for in-service training for State statistical personnel at the intermediate and junior levels like district statistical officers, progress assistants in community development blocks and other field staff.

32. *Technical assistance.*—Technical assistance schemes under the United Nations, Colombo Plan, the Technical Cooperation Agreement with the U.S.A. and arrangements for training with a number of other countries such as U.S.S.R., France, Netherlands, etc., and with foreign universities and Foundations have provided valuable opportunities for training over a large range of specialised and advanced fields of study, and several thousands of Indians have profited from them. In turn, to the extent possible, India has endeavoured to share its training facilities with other countries. An effort has also been made to meet such requests as have been received for trained personnel from India. To derive the maximum benefit from the various technical assistance programmes under which facilities are made available to India, it is essential that the gaps in personnel which are at present anticipated should be precisely identified and the selection of trainees and the scope of the training to be provided should be determined on the basis of careful study of requirements over the period of the Third and the Fourth Plans. In turn, in augmenting her own training facilities and in building up cadres of trained workers, due account should be taken of the demands from other countries which India may be called upon to meet in different fields in the coming years.

CHAPTER XII

NATURAL RESOURCES

I

INTRODUCTION

UNDER its terms of reference, the Planning Commission was required to—

(i) make an assessment of the material, capital and human resources of the country including technical personnel and investigate the possibilities of augmenting such of these resources as are found to be deficient in relation to the nation's requirements, and

(*ii*) formulate a Plan for the most effective and balanced utilisation of the country's resources.

Accordingly, the First Five Year Plan presented an account of the land, water, mineral and energy resources of the country on the basis of information then available. It drew attention to the main problems in each field and set out programmes for further surveys and investigations. It also offered suggestions for strengthening the organisations responsible for these surveys, providing them with personnel and equipment, and expanding programmes of training.

Over the past few years organisations dealing with the survey and utilisation of natural resources, such as the Indian Council of Agricultural Research, the Central Water and Power Commission, Central Board of Irrigation and Power, Geological Survey of India, Oil and Natural Gas Commission, Indian Bureau of Mines, Survey of India, Forest Research Institute, Atomic Energy Commission, and the Council of Scientific and Industrial Research and its National Laboratories have been greatly expanded and have undertaken a series of new surveys and investigations. These surveys have resulted in a fuller assessment of the country's natural resources bringing to light the gaps in information relating to these resources as also their deficiencies in relation to the nation's future requirements.

2. The objective of planning is to raise the standard of living of the people as a whole. The attainment of this objective involves the development on scientific lines of the nation's natural and human resources.

Expanded demand for natural resources and materials has led to technological developments which have in part overcome limitations and thus increased the supply of resources. The dynamic forces at work in creating shifts in the demand for and supply of natural resources necessitate their continuous study as well as reformulation of policies relating to them. Natural resources must be looked at in a coordinated manner and their investigation and utilisation planned for long-term needs. The extent to which resources have been studied and possibilities established ahead of needs is an important factor determining the rate at which the economy can grow.

3. With the formulation of the Third Five Year Plan, the stage has reached when, as a necessary condition of well-conceived long-term plans, a comprehensive view needs to be taken of the extent and quality of the information available in respect of the country's main natural resources. The principal gaps which exist, the surveys required in this connection, and the further steps needed in relation to specific long-range objectives, such as irrigation, power, steel, coal, oil and minerals, land use and forest resources have to be identified. As stated earlier, over the next 15 years, population may increase by about 187 million. Increase in labour force is reckoned at about 70 million, of whom some two-thirds must be absorbed outside agriculture. It becomes, therefore, a matter of the greatest importance that a high rate of economic growth is achieved and sustained during this period. Her natural resources give India a large potential for agricultural and industrial production, and their rapid development is an essential condition for the achievement over the next two or three Plan periods, of a self-reliant and self-sustained economy which can provide to the mass of the people continually rising living standards and opportunities for gainful employment. The long-term goals in national and per capita incomes and the development of agriculture, irrigation and power, and the provisional targets suggested earlier for industries like steel, aluminium, coal, oil refining, fertilisers, cement and others can only be achieved in time if the nature and extent of the natural resources of the country and the essential requirements concerning their development are assessed and the necessary steps taken well in advance. For balancd development, it is equally necessary to assess availabilities, requirements and possibilities in relation to each of the principal regions within the country.

4. In the Chapters on irrigation and power, forests, industries, minerals and others, an attempt has been made to indicate the main directions in which further efforts are needed to ascertain more fully the resources of the country and the measures required for their more rapid development. The object of the present Chapter is to set the problem

of assessing and developing natural resources in the context of the Third and subsequent Plans and to explain briefly some of the implications in this respect of the growth of population and of intensive and large-scale industrialisation.

A unit for Natural Resources has been recently set up in the Planning Commission for studying problems relating to the assessment and development of natural resources and assisting the various agencies engaged in the survey and investigation of these resources in linking up their work closely with the requirements of the rapidly growing economy, and generally, helping in securing a common approach in various related fields. This unit will be strengthened as its work develops. In collaboration with other organisations, it is hoped to arrange for coordinated studies of natural resources on a continuing basis, to specify gaps in the existing information, particularly from the aspect of long-term development, and to suggest suitable policies and measures for giving effect to them. Against this background, it is proposed briefly to review recent developments and to indicate the problems that lie ahead in relation to the development of the land, water, mineral, energy and other resources of the country.

II

LAND RESOURCES

5. The most important natural resource of the country is land, which is the base for agricultural production. While population grows, the land surface is fixed, and of this only a certain proportion is available for cultivation. Several aspects of the problem need to be studied. Through irrigation and other measures of agricultural development, the productivity of land can be considerably increased. It is necessary to ascertain the extent to which land now lying waste can become available for cultivation. Increasing population also means withdrawal of areas now under farms for building houses. Development of communications such as roads, railways, and airways may take up fertile land. Owing to rapid urbanisation and growth of large cities land is needed for parks and open spaces. Irrigation dams may submerge fertile areas. Industrial plants and other establishments also require substantial areas. In all these developments wherever fertile land can be saved efforts should be made to do so. This indicates the need for a comprehensive inventory of land and for greater refinement in land classification and continuous attention to land use.

6. *Land utilisation.*—The total geographical area of India is about 806 million acres, of which reporting area is about 721 million acres and net area sown is about 318 million acres. The broad features of

the present pattern of land utilisation and that anticipated by the end of the Third Plan are set out in the Table below:

Table 1: Land utilisation in 1965-66

(area in million acres)

	1955-56	1960-61	1965-66
total reporting area	720·0	721·0	721·
forests	125·6	131·0	132·0
land under miscellaneous tree crops and groves	13·9	14·0	15·0
permanent pastures and other grazing lands	28·4	32·0	32·0
culturable waste	54·8	47·0	40·0
barren and uncultivated land and land put to non-agricultural use	118·7	114·0	114·0
fallow lands other than current fallows	30·9	28·0	26·0
current fallows	29·5	28·0	25·5
net area sown	318·2	327·0	335·0
area sown more than once	44·4	51·5	67·0
gross area sown	362·6	378·5	402·0

Availability per head of cultivable land in India is about 0·82 acres as against 0·42 in U.K., 0·48 in Germany, 0·17 in Japan, 0·50 in China, 2·68 in U.S.A. and 2·59 in U.S.S.R.

7. *Soil surveys.*—Until recently knowledge of soils in different parts of the country was inadequate and the necessary organisation for soil surveys had not been established. Appraisal of soil resources, involving survey and classification of soils provides the basis for assessing their potentialities as well as their limitations for effective exploitation and rational land use. The main object of soil surveys is to classify and map out the various types of soils, to know soil differences, and to coordinate knowledge of soils with a view to laying down standards of nomenclature, etc. With the aid of these surveys it becomes possible to prepare schemes for the better use of land and to plan for soil conservation and irrigation and drainage works. In 1955 an all-India soil survey scheme was initiated at the Indian Agricultural Research Institute with a view to carrying out reconnaissance soil surveys leading to correlation of soils of different regions. Soil correlation work involves classification and laying down of nomenclature of soils on a uniform basis and also the preparation of soil survey reports and soil maps. In the field of soil surveys, State Governments are specially concerned with aspects relating to agriculture, forestry, irrigation, drainage, soil conservation, etc. Since there are common soil problems covering more than one State and all States do not have their own soil survey organisations, with a view to coordinating work on soils, it was felt that the best course would be to set up laboratories on a regional basis for the four major soil groups occuring in India, namely, (1) at Delhi, for the

Alluvial Soil Region, (2) at Poona (now at Nagpur) for the Black Soil Region, (3) at Kharagpur (now at Calcutta) for the Red and Laterite Soil Region I, and (4) at Bangalore for the Red and Laterite Soil Region II. Three years after its inception, the scheme was integrated with the scheme for soil and land use planning drawn up by the Central Soil Conservation Board for the purpose of soil and land use survey in the catchment areas of six major river valley projects, namely, Machkund, Hirakud, Chambal, Bhakra Nangal, Kosi and Damodar, totalling about 78,000 square miles. Surveys in the catchment areas aim at classifying lands into capability classes essentially from the point of view of adopting soil conservation measures with a view to minimising soil erosion, preserving the top soil for cultivation and preventing sediment flowing into storage reservoirs, and thus increasing their life. Soil conservation work in the catchment areas involves detailed surveys in agricultural lands and reconnaissance surveys in other areas. The total area to be surveyed is about 500,000 square miles. By the beginning of 1961, an area of about 18,000 square miles had been covered by both detailed and reconnaissance surveys undertaken through the all-India scheme. Of this area, about 3000 square miles fall within the catchment areas of the river valley projects. Soil survey organisations in the States have surveyed about 50,000 square miles. Under the all-India programme, about 23,000 square miles are to be surveyed during the Third Plan.

8. *Survey of wastelands.*—Agricultural production can be stepped up through extension of area under cultivation by cultivating waste lands, double cropping of single crop areas, and other measures of intensive farming. There is considerable scope for extending the gross area sown by double cropping. It is anticipated that the area sown more than once might increase from about 52 million acres in 1960-61 to about 67 million acres by 1965-66. According to the available land utilisation statistics the area under culturable waste in 1955-56 amounted to about 55 million acres. In June 1959, the Government of India constituted a Committee to make a survey of land classified as "other uncultivated land excluding fallow lands" and "fallow lands other than current fallows" and to locate areas where large blocks of land are available for reclamation and resettlement. The Committee has completed its survey of seven States. In these, the area of wasteland available for cultivation in blocks of 250 acre or more is reckoned at nearly a million acres. The Committee's findings regarding the present statistics of wastelands are of considerable importance. On the whole the existing data are not sufficiently reliable, and lands classified as culturable waste at the time of settlement often continue to be shown as such in the revenue records long after they have come under cultivation. In the view of the Committee, the mere collection of statistics under the head 'culturable waste' can serve little purpose and

detailed information should be available about the types of wastelands in each State, the ownership of such lands, their availability in sizeable blocks and the cost of reclamation measures. The Committee has, therefore, recommended that rapid reconnaissance surveys should be conducted for collecting such information.

9. To sum up, there are large gaps in the information at present available regarding land resources. To secure quick results it is necessary that land surveys using photogrammetric techniques (aerial photographs) should be undertaken, and data on land use, land improvement, reclamation of water-logged, saline and alkaline lands and productivity should be collected in a systematic manner with a view to drawing up further plans.

III

Forest Resources

10. Out of the total geographical area of 1·26 million square miles, about 274,000 square miles or about 21·8 per cent of the area consists of forests. Due to variations in climatic conditions and differences in altitude a large variety of natural vegetation ranging from temperate to tropical is found in the forests of India. Forests may be classified as follows:

Table 2: Classification of forests

	percentage
temperate forests	
coniferous	3
broad-leaved	4
tropical forests	
deciduous	80
evergreen	12
others	1

11. The productivity of India's forests can be greatly increased. Forests are among the few renewable resources in nature which, if properly managed, could go on yielding at undiminished rate and for an indefinite period. There is shortage of timber and fire-wood, of raw materials for drugs, paper and pulp and of fodder for cattle.

12. Wood and other forest products are basic raw materials essential for industrial development. In the past no proper appraisal of local forest resources was made and products such as paper or pulp, plywood, *tannin*, etc., were freely imported. With a view to developing such

industries in the country, an appraisal of the position of such raw materials is a matter of importance. The consumption of industrial wood in India is as low as 0·6 cft. per capita per year as against 16·0 cft. in France and 13·4 cft. in Japan. India's present requirements of industrial wood amount to 4·5 mililon tons and are estimated to be more than 9 million tons in 1975. As regards firewood resources, in the ordinary course, a demand of 100 million tons is anticipated by 1975.

13. It is essential that a sustained increase in production should be secured from year to year through intensive development schemes, including selection of high yield areas, planting of quick-growing species, introduction of improved logging and processing techniques, development of communications and more generally, the linking of forest development with specific schemes of industrial development to be undertaken over the next few years. While the requirements and supplies of industrial wood are still more or less balanced, it is considered that over the next 10 or 15 years unless special steps are taken, acute shortages might be experienced. This calls for measures for the intensification of production, development of hill forests, improved utilisation of low grade timbers, economy in fuel wood consumption and systematic surveys of forest resources in relation to specific industries. It is also necessary to undertake a survey of forest lands, indicating areas which are badly eroded, those fit for natural regeneration and those where planting should be undertaken. In some areas, specially in Central and South India, there are natural forests with trees which have only fuel value. These areas can be covered with valuable planted forests. There is need too for obtaining data regarding forest resources in inaccessible areas.

IV

WATER RESOURCES

14. Water resources may be divided broadly into surface water and underground water. Their development has to be viewed in relation to the need to increase the productivity of land through irrigation, flood control, drainage and other means and also to domestic and industrial requirements.

15. *Surface water.*—The annual rainfall over the entire country represents something more than 3000 million acre-feet of water. Of this amount, about 1000 million acre-feet are lost immediately due to evaporation and roughly 650 million acre-feet seep into the soil, leaving 1350 million acre-feet to flow into the river systems. The entire surface flow cannot be utilised because topography, flow characteristics, climate and soil conditions impose limits on usability. It has been estimated

that only 450 million acre-feet can be harnessed for purposes of irrigation. Progress in actual utilisation is as follows:

Table 3: *Surface water utilisation for irrigation*

	million acre-feet	as percent of usable flow	as percent of total flow
up to 1951	76	17	6
up to 1960-61	120	27	9
up to 1965-66 (anticipated)	160	36	12

16. *Underground water.*—Of the 650 million acre-feet of water that seep down annually into the soil, about 350 million acre-feet get absorbed in the top layers, thereby contributing to soil moisture which is essential for the growth of vegetation. The remaining 300 million acre-feet percolate down into porous strata and represent the annual enrichment of underground water. The total storage underground at any particular time may be several times this amount, but it can be assessed only if a country-wide investigation is undertaken. The actual utilisation of underground water at present is less than 20 per cent of the annual enrichment. Over the past eight years, through a series of ground-water exploration projects, efforts have been made to establish areas favourable to the sinking of tube-wells. For the Third Plan, a project including 500 exploratory borings has been accepted. With a view to facilitating the work of exploration and reducing the need for large-scale drilling, it is also proposed to carry out geophysical investigations. In peninsular India such investigations would quickly determine the depth of the bed rock and are likely to give first indications of ground-water availability. A survey programme is also in hand in Andhra Pradesh for localising areas of underground water where filter points for extraction of water can be successfully drilled.

17. *Utilisation.*—The major use of water is for irrigation and hydro-power generation, but water is also used for public water supply, industrial and navigation purposes. Water supply for irrigation can be obtained both from surface and underground resources.

18. The Central Water and Power Commission initiated in 1954 a study of different basins in the country for assessing the ultimate potential of major and medium irrigation projects. For purposes of this study the country was divided into five principal zones covering groups of river basins, and for each river basin the topography, rainfall, intensity of cultivation, possible storage sites, irrigable areas, reservoir capacity and other relevant factors were examined. Studies in respect of four zones are almost complete, while the fifth has still to be taken up.

A preliminary assessment places the irrigation potential of major and medium projects at 100 million acres (gross) distributed as follows:

Table 4: Irrigation potential of major and medium projects

		irrigation potential (million acres)
zone 1 :	West-flowing rivers (covering river basins in Kerala, Mysore and Maharashtra States and the basins of Tapti, Narmada & others)	10
zone 2 :	East-flowing rivers (covering the basins of Tambraparani, Vaigai, Cauveri, Mahanadi, Godavari, Krishna, Pennar and others)	33
one 3 :	Indus basin	13
zone 4 :	Ganga basin (covering Chambal, Jamuna, Ramganga, Tons, Gomti, Sone, Ganga and its tributaries) . .	41
one 5 :	Brahmaputra basin	3
	total	100

The net area irrigated by major and medium projects at the end of the Second Plan is about 31 million acres.

19. The first comprehensive attempt towards assessment of the minor irrigation potential was made in 1955 by the Minor Irrigation Committee set up by the Ministry of Food and Agriculture. Similar studies were later initiated by the Minor Irrigation Team of the Committee on Plan Projects. Some State Governments have also initiated minor irrigation surveys. A tentative appraisal of the data from these surveys indicates that the total ultimate irrigation potential of minor irrigation projects may be about 75 million acres (gross).

20. It will be seen that there is considerable scope for increasing the ratio of irrigated area to cultivated area. By realising the entire potential for irrigation of 175 million acres (gross) over the next 20-25 years (by which time the cultivated area may increase to about 350 million acres) the proportion of irrigated lands may perhaps rise to 50 per cent. Correspondingly, the amount of water utilised may go up to 350-400 million acre-feet or 60 per cent of the annual supply from both surface and underground sources. That will leave adequate quantities of water for meeting public supply, industrial needs and the requirements of thermal power generation the demand for which is likely to rise steadily.

21. *Industrial uses.*—The major uses of water in industry are for cooling, processing and boiler feed. Industrial needs of water are increasing rapidly. Hence the need to pay attention to methods of conservation and re-use of water in industries has become urgent. Most of the water used for industrial purposes is renewable in the sense that it becomes available for re-use if properly reconditioned.

22. One of the important problems associated with industrialisation and urbanisation is the pollution of available water supplies, specially rivers, by industrial effluents and trade waste. This leads, amongst others,

to mortality of fish and contamination of drinking water. Proper disposal of these wastes is difficult and costly. The problems which arise in this connection are being studied by the All-India Institute of Hygiene and Public Health, the Indian Council of Medical Research and the Public Health Engineering Research Institute. There is need for coordinated surveys and experimental work. These should cover analysis of effluents, data on extent of pollution caused by them, development of methods for their treatment and preparation of standards to which they should conform, before they can be discharged into rivers.

VI

FISHERIES

23. *Inland fisheries.*—Rivers and their tributaries, canals, lakes, reservoirs, tanks and ponds with perennial water supply constitute a rich potential source of inland fisheries. Out of 1·4 million tons of annual catch about 300,000 tons are from inland water. In the first Plan over a million acres of inland waters were surveyed and 68,000 acres reclaimed. In the Second Plan about 340,000 acres of inland waters have been surveyed and an area of 720,000 acres stocked. The Third Plan includes proposals for the development of more than 50,000 acres of water area as demonstration fish farms, 1500 acres for estuarine fish culture and reclamation of about 1500—2000 acres of marshy and fallow lands for fish culture. An urgent need is a complete survey of waters which do not dry up during summer and which can be stocked with fish. An inventory of the existing waters as to type, namely, ponds, reservoirs, lakes, rivers, etc. and the areas under each type should be prepared. This should be followed by a detailed inventory of the physical, chemical and biological features. When this work is completed, it will provide a sound basis for development of the inland fisheries resources.

24. *Marine fisheries.*—Out of the total fish production of 1·4 million tons annually about 1·1 million tons are marine. Of the marine fisheries, the most important are the mackerel, sardines and prawns. India's need is estimated at about 4 million tons but the production rate is only about a quarter of requirements. The sea fisheries generally exploited are confined to 6—10 miles from the coast.

India's marine fisheries resources have not been properly assessed and there is need for a comprehensive survey. The importance of this survey is underlined by the fact that the resources of the sea can supplement those of the land to a significant extent.

VII

MINERAL RESOURCES

25. Minerals play an important part in the industrial economy of the present day—some like coal and mineral oil are sources of energy, others

are raw materials for industry, while a few are the ultimate source of synthetic substitutes for natural materials like rubber, timber, cotton and others.

The country has fairly abundant reserves (in terms of volume) of coal, iron ore and mica, adequate supplies or ores of manganese, titanium and aluminium, raw materials for refractories and lime-stone, but there is deficiency in ores of copper, lead and zinc. There are no workable deposits of tin, nickel, molybdenum and elemental sulphur. Until recently, except for Digboi in Assam, mineral oil was not known to occur in other parts of the country.

26. *Coal.*—Coal is India's most important mineral asset and is the main source of commercial energy. Reserves of coal estimated for seams of thickness 4 feet and above are of the order of 50,000 million tons, of which coking coal accounts for 5·6 per cent, or about 2800 million tons. Inferred reserves are placed at 80,000 million tons. In addition about 2075 million tons of lignite are estimated to be available.

The coking coal reserves are a matter of concern in future. For every ton of steel 2·2 tons of coal are required. The rapid increase in the output of steel visualised during the next 15 years will increase the demand for coking coal. There is need to conserve carefully the limited reserves of coking coal. The position in regard to non-coking coal is not unsatisfactory, but since the bulk of the resources are of the low grade, economy in the consumption of better grade coal is essential.

The overall coal resources are highly concentrated. About 80 percent of the present supply comes from a group of mines in a 200-mile section of Bihar and West Bengal, thereby making it necessary for coal to be hauled over distances of 400-1400 miles for consumption in Southern and Western India. Efforts are being made to increase production from coalfields outside Bihar and West Bengal—their production increased from 5·7 million tons in 1951 (16 per cent of the total) to 10·2 million tons (20 per cent of the total) in 1960. By the end of the Third Plan the output of coal outside Bihar and West Bengal is expected to increase to about 28 million tons or 29 per cent of the total production in the country.

27. *Mineral oil and natural gas.*—Next to coal, petroleum and natural gas are major sources of commercial energy. So far India has not developed any considerable domestic petroleum supplies. However, intensive exploration for oil is under way. New oil wells in Assam are expected to produce about 2·75 million tons of oil per annum in the initial stages which is likely to increase by the end of the Third Plan. Considerable quantities of natural gas are found associated with petroleum in Assam and in addition there is non-associated natural gas also. Plans have been made for utilising the associated natural gas. Recent drilling operations

in Cambay and Ankaleswar areas have given encouraging results and the production from these areas may reach about 2·0 million tons by 1965-66.

The annual increase in the demand for petroleum products which was 4·5 per cent during the last decade is expected to rise to 10—11 percent in the current decade. The total demand which was about 7·5 million tons in 1960 is expected to rise to over 11 million tons in 1965-66 involving a foreign exchange expenditure of over Rs. 50 crores for meeting the deficit of 5 million tons by imports. Household requirements (chiefly kerosene for lighting) represent about 25 percent of the total consumption. The demand of the transport sector (diesel oil and gasoline) is more than 30 percent. The share of industry is about 20 percent mainly in the form of furnace oil. There has been a significant increase in the consumption of middle distillates comprising kerosene and diesel oil.

28. *Other minerals*.—Though the principal mineral regions have been ascertained and a broad indication obtained of the potential mineral wealth of the country, until recently no detailed investigations had been undertaken for a quantitative and qualitative assessment of the country's mineral resources. With the initiation of the planned development of the country attention was paid to systematic and detailed surveys and investigations by the Geological Survey of India, Indian Bureau of Mines, National Laboratories and Atomic Energy Commission with a view to a quantitative and qualitative assessment of the reserves of the more important minerals and their proper utilisation and the adoption of a policy aimed at systematic exploitation of minerals with due regard to conservation. As a result of surveys carried out during the last ten years, more information is now available of the extent of mineral reserves and their quality. Estimated reserves of manganese ore have now gone up from 20 million tons to 180 million tons. The assessment of sulphur-containing pyrites in Amjor area (Bihar) opens up the prospect of meeting a substantial part of demand of sulphur from internal production. Reserves of copper ore, iron ore, chromite, bauxite, magnesite, gypsum, limestone, lead and zinc, etc. have now been assessed and the gaps between requirements and availability determined.

The National Laboratories have carried out investigations with a view to improving the quality of minerals, making them usable (through investigations on the washing of coal, manganese ore, copper ore, etc.), finding uses for materials which would otherwise be wasted (as in the utilisation of scrap and waste mica) and substituting scarce metals by metals available within the country (for instance, nickel-free stainless steel and coinage alloys and aluminised steel wires).

29. The Mines and Minerals (Regulation and Development) Act, 1948 which was subsequently amended and elaborated in 1957, and the rules framed thereunder have brought a measure of uniformity in regard

to leasing of mineral properties and for ensuring systematic development of the mineral resources of the country. The Coal Mines Conservation and Safety Act, 1952 provides for the adoption and enforcement of methods of conservation in regard to coal.

30. Though in the recent past a considerable amount of work has been done in the study of mineral resources and in assessing reserves in quantitative and qualitative terms in particular areas, in the context of rapid industrial development of the country and the consequent increasing demand for mineral raw materials, exploration for and investigation of mineral deposits requires to be pursued with greater vigour in order to know more fully the minerals available and eventually their quality and quantity. The importance that has to be attached to this will become clear from the following Table which gives against the more important minerals the known reserves, the present production and the present demand thereof.

Table 5: Production and demand for minerals

mineral	unit	estimated reserves	present production	current consumption
coal (non-coking)	million tons	50000	37·0	51·8
coal (coking)	million tons	2800	14·8	
lignite	million tons	2073	negligible	negligible
mineral oil	million tons	not assessed	0·2†	6·0† 1·3‡
manganese ore	million tons	180	1·2	0·3
iron ore	million tons	21870	10·5	8·0
chromite	million tons	2·3	0·10	0·02
vanadium ore	million tons	26·7	..	..
tungsten (metal)	tons	not assessed	3·0	3·0
nickel (metal)	tons	negligible	..	1020
ilmenite (titanium ore)	million tons	350	0·25	0·01
copper (ore)	million tons	32·9	0.44***	0·07 (metal)
lead ore	million tons	10·7@	3670 tons (metal)	0·03(metal)
bauxite (aluminium ore)	million tons	260	0·38	0·10*
zinc ore	million tons		0·01**	0·0[illegible]**
gypsum	million tons	1117	0·98	0·05
magnesite	million tons	100	0·15	0·14
limestone	million tons	15740	12·5	12·5
phosphatic nodules	million tons	2·0	..	
apatite	million tons	0·87	0·014	0·22
tin (metal)	tons	negligible	..	4550
graphite	tons	not assessed	1500	2500
sulphur (element)	million tons	negligible	..	0·18
pyrites (40 percent)	million tons	384	..	..
asbestos	tons	580000	1683	30[illegible]

*1959 figures
**concentrates
***equivalent to 8767 tons of metal
@includes zinc ore also
†crude
‡product

31. Apart from the urgent necessity of more intensive exploration for minerals, there is need for enforcement of measures for conservation. Measures for conservation in relation to minerals will mean mainly avoidance of waste in mining and processing and in a large sense the substitution of scarce materials by those which are abundantly available in the country. Avoidance of waste in mining requires that there should be no selective mining—the richer and the poorer grades should be worked together and then blended to obtain a marketable grade. Upgrading of low grade ores (e.g. beneficiation of manganese ore, coal, copper ore, etc.) and utilising byproducts of mining and processing, (e.g. sintering of iron ore fines and utilising washery middlings) are also measures of conservation.

VIII

ENERGY

32. The demand for energy in India is growing rapidly due to industrialisation, increasing transport facilities and rising standards of living. India's consumption per head is still among the lowest in the world.

33. *Pattern of production and consumption.*—The total production of energy in India during 1960-61 was roughly of the order of 165 million tons of coal equivalent. The commercial sources of energy are coal, petroleum and falling water. Wind power and solar, geothermal and tidal energy may constitute future sources subject to appropriate technological developments. Nearly 61 per cent of the energy comes presently from non-commercial sources, such as cattle dung, wood, charcoal, farm wastes, etc. as will be apparent from the following Table. Amongst the non-commercial sources of energy, that from animate effort has not been taken into account. This has been estimated to be equivalent to 76 million tons of coal per year.

Table 6: Consumption of energy in 1960-61

source	energy consumed (million tons of coal equivalent)	as per cent of commercial energy	as per cent of total energy
coal	54·6	84·0	33·0
oil	9·5	14·6	5·8
water	0·9	1·4	0·6
total—commercial	65·0	100·0	39·4
cattle dung	46·0		27·9
fuel wood	35·0		21·2
agricultural waste	19·0		11·5
total—noncommercial	100·0		60·6
total—all sources	165·0		100·0

34. *Non-commercial sources of energy.*—Dried cattle dung is the main source of energy for cooking and heating throughout the rural area and in many urban households as well. It has been estimated that the amount of cattle dung annually available is 1200 million tons (wet weight) of

which 400 million tons are used as fuel and 215 million tons as manure, the balance being wasted. On the basis of energy content, 400 million tons of dung is equivalent to 46 million tons of coal. Wood is used as fuel both for domestic purposes as well as by some industries either directly or in the form of charcoal. The fuelwood consumption of the country is estimated to be of the order of 60 million tons, which in terms of energy equivalent would be equal to roughly 35 million tons of coal.

35. *Commercial sources of energy.*—These include coal, mineral oil and natural gas which have been considered in the previous section, and electricity which is discussed below.

Electric power.—Large quantities of low grade coal and middlings will be available at collieries and washeries for generation of power. These locations are therefore well suited for coal-fired stations. Hydel stations take a long time to set up, involve relatively large outlays and are, by their very nature, located in relatively remote localities from which the power has to be transmitted over long distances. These are, however, the cheapest source of power. The break-up of generating capacity among different types of plants is indicated below:

Table 7: Generating capacity by source

(million kilowatts)

	1951	1956	1961	[illegible]
hydel plant	0·56	0·94	1·93	[illegible]
coal	1·59	2·27	3·46	[illegible]
oil	0·15	0·21	0·31	[illegible]
nuclear	..	.		[illegible]
total	2·30	3·42	5·70	[illegible]

Currently, the electric energy consumption in India is about 45 kWh per head of population. In 1950, it was 14 kWh and in 1958, 35 kWh and by 1965-66 this is expected to increase to about 95 kWh per capita. This rate of increase will need to be maintained for a long period. Compared to other countries India's consumption is extremely low. In Japan per capita consumption rose from 455 kWh in 1947 to 930 in 1958; in Italy during the same period it rose from 454 kWh to 928.

Water power.—The potential of water power has been generally estimated to be about 41 million kW distributed as shown below.

Table 8: Water power potential

([illegible])

west-flowing south Indian rivers	[illegible]
east-flowing south Indian rivers	[illegible]
central Indian rivers	[illegible]
rivers of Ganga basin	[illegible]
rivers of Indus basin	[illegible]
Brahmaputra and others	[illegible]
total	[illegible]

However, extensive surveys of individual project sites involving contouring, reservoir areas, flow characteristics, availability of local construction materials, etc., have to be undertaken before this potential can be more definitely assessed and harnessed. In the Third Plan 64 specific project sites are proposed to be investigated.

Nuclear energy.—For a self-sufficient atomic energy programme an adequate supply of fuel material is a prerequisite. It has been known for several decades that in the monazite sands found on the beaches of the Kerala and Madras coasts India has one of the largest deposits of thorium in the world, containing no less than 200,000 tons of thorium in a concentration of over 9%. As a result of the work of the Atomic Minerals Division, during the period of the Second Plan an even more extensive monazite deposit has been discovered in the State of Bihar which contains no less than 300,000 tons of thorium in a concentration of over 10%. India thus has the largest known thorium reserves in the world equalling in amount the total world reserve of uranium. Several deposits of uranium also have been discovered in various parts of the country, which are still being proved by drilling. A deposit containing several thousand tons of uranium has, however, been established in Bihar and steps are being taken to open up a mine to produce a thousand tons of ore a day. Nuclear power plants are expected to make a progressive contribution towards meeting the growing demand for power.

36. *Unconventional sources of energy.*—Attempts to convert primary forms of energy such as solar radiation, wind motion, tidal energy, heat of the earth and oceans, etc. are being made in different parts of the world. Of the several devices developed so far, solar house heating, solar batteries and wind power generators have proved reasonably successful in many places. Tidal motion has also been harnessed in some countries.

In India, work has been done on the development of a solar cooker, a solar evaporator and prototype windmills. A great deal of research and experimentation and several years of development work go into every device meant for catching the energy of the sun, wind or tides in an efficient and economical manner. Research schemes for tapping unconventional sources of energy should be developed.

IX

Resources of the Sea

37. India has a coastline of about 3530 miles, a continental shelf of more than 10,000 square miles and a large number of gulfs and bays along the coast. This alone indicates the vast possibilities of marine resources in the form of marine algae, fish and other edible animals as well as

minerals. Oceans are huge reservoirs of organic material and photosynthesis occurs in them at greater rate than in forests or grasslands. The importance of marine fisheries has already been stressed. Marine algae (seaweeds) are a promising source of food which still remains unexploited in India. Sea-weeds are also the source of agar, alginates, mucilages and iodine. Some of them can be used for making jams, jellies etc. for human consumption. Addition of sea-weeds to cattle feeds in other countries has proved remarkably beneficial due to the presence of trace elements which the farm animals generally lack. Similarly, incorporation of sea-weed—cowdung compost to soil proved much more beneficial to crops than cowdung alone. A preliminary survey conducted by the Central Marine Fisheries Research Station, Mandapam, indicates that systematic exploitation of sea-weeds could be quite profitable. There is need for a comprehensive survey of the availability of economic sea-weeds on India's coastline and their utilisation.

38. Mineral resources from the sea hold considerable promise. Of these, the most important is the common edible salt. Its production in 1958 was about 4·2 million tons valued at about Rs. 8·5 crores. At present very little use is being made of salt bitterns which are a source of magnesium chloride, potassium chloride and bromine. Against a possible quantity of a million tons, only 8000 tons of magnesium salts are recovered. Only a few hundred tons of potassium chloride are recovered against a possible total of 90,000 tons. Similarly, bromine is recovered to the extent of 25-30 tons against a possible total of several thousand tons. The ocean is likely to become the major source for sodium, potassium, magnesium, bromine and chlorine. A recent development is the possibility of recovering manganese, cobalt, nickel, copper and thorium from nodules that occur on the deep sea floor. So far no surveys have been made to estimate the mineral resources of the ocean bed.

X

Surveys and Programme of Work

39. The Survey of India, the Botanical Survey and the Zoological Survey have been strengthened under the first two Plans and have undertaken extensive surveys in their respective fields. Thus, the Survey of India has carried out surveys in connection with the multi-purpose river valley projects, oil refineries, coalfields and the lead-zinc zones in Rajasthan. The Botanical Survey of India was engaged in exploring plant resources of the country. The Zoological Survey has been engaged in collecting scientific information regarding animals, fish, birds, insects, etc. and its studies are of great importance in the fields of public health agriculture and forestry.

40. The Council of Scientific and Industrial Research and the National Laboratories have undertaken a number of important surveys. Among these, mention may be made of studies of wind velocity, tanning materials to replace imported wattlebark, road materials, medicinal plants, raw materials for glass and ceramics, refractories, paper and pulp, and food and agricultural wastes and their utilisation.

41. Several surveys of a regional character have been undertaken in recent years and some are in progress. Under the auspices of the Planning Commission, the Indian Statistical Institute has carried out a pilot regional survey of Mysore and also a less elaborate survey of the State of Kerala. A diagnostic survey of the Damodar region is being carried out jointly by the Institute of Technology, Kharagpur and the universities of Calcutta and Patna. The survey is potentially of great importance for the planning and development of the Damodar Valley area. The National Council of Applied Economic Research has, at the instance of the State Governments concerned, undertaken techno-economic surveys of the States of Andhra Pradesh, Assam, Bihar, Kerala, Madhya Pradesh, Madras, Mysore, Orissa, Punjab, Rajasthan and West Bengal. It has also completed for the Government of India surveys of the Union Territories of Himachal Pradesh, Manipur and Tripura. These surveys bring together a considerable body of information and will be of use as bench marks for later studies. They also indicate possibilities of development which need to be studied further. The survey of the metropolitan region of Delhi, completed recently, has value not only for the development of the region but also as a pioneering effort of interest to other large towns. A similar survey is proposed to be carried out for Calcutta.

42. Natural resources cover a most extensive field and, within the compass of a short chapter, it is not possible to do more than touch upon a few broad features of the subject. Over the past ten years, a great deal of new information regarding the country's natural resources has become available. The principal organisations engaged in surveys of resources are now equipped with personnel and expertise to expand their activities even more rapidly in the future. States are also more fully seized of their own problems of resource development. Considerable numbers of highly trained scientists and technologists are already engaged in studies relating to resources. There is growing recognition of the need for conservation of natural resources in all fields, but in this direction much still remains to be done. A great deal of valuable scientific research is being undertaken for resource location and resource utilisation in the National Laboratories, in the universities and in other research establishments. Technological changes are already transforming the economic life of the country. With economic development, there will also be greater technological progress and many new possibilities will open up. The preparation of a long-term plan of economic development,

stretching over the next fifteen years and more can serve as a common thread to hold together and help interpret the results of scientific research and the growing knowledge being gained of the country's resources. It will also point to gaps that exist and suggest new problems for study. The task ahead is one of considerable magnitude and will call for continuous cooperation between the Planning Commission, the various research organisations of the Central Government, Departments in the States, leading institutions engaged in scientific and economic research and the universities. The potential for development of India's natural resources is vast; with systematic study and exploration of these resources and the increasing application of science and technology in their assessment and utilisation, the possibilities of economic growth may be enlarged far beyond the present anticipations.

CHAPTER XIII

COOPERATION

Cooperation and Planned Development

In a planned economy pledged to the values of socialism and democracy, cooperation should become progressively the principal basis of organisation in many branches of economic life, notably in agriculture and minor irrigation, small industry and processing, marketing, distribution, supplies, rural electrification, housing and construction, and the provision of essential amenities for local communities. Even in medium and large industries and in transport, an increasing range of activities can be undertaken on cooperative lines. The socialist pattern of society implies the creation of large numbers of decentralised units in agriculture, industry and the services. Cooperation has the merit of combining freedom and opportunity for the small man with benefits of large-scale management and organisation as well as goodwill and support from the community. Thus, a rapidly growing cooperative sector, with special emphasis on the needs of the peasant, the worker and the consumer becomes a vital factor for social stability, for expansion of employment opportunities and for rapid economic development. Along with a growing public sector and a private sector which functions with responsibility to the community as a whole, the influence of cooperation extends far beyond the particular activities organised on cooperative lines, and gives to the social structure and the national economy, balance, direction and a sense of values.

2. Economic development and social change are equally vital elements in the reconstruction of India's social and economic structure. Cooperation is one of the principal means for bringing about changes of a fundamental nature within the economy. As was stated in the Second Five Year Plan, in a country whose economic structure has its roots in the village, cooperation is something more than a series of activities organised on cooperative lines; basically, its purpose is to evolve a scheme of cooperative community organisation which touches upon all aspects of life. Within the rural economy, in particular, cooperation is the primary means for raising the level of productivity, extending improvements in technology and expanding employment so as to secure the basic necessities for every member of the community.

3. At the level of the village, cooperation implies the development of land and other resources and various services in the common interest of the village as a whole and a continuing obligation on the part of the

village community towards all its members. It is, therefore, visualised that as part of a larger cooperative rural economy, the broad aim of policy should be to develop the village as the primary unit of organisation in agriculture and in many other economic and social activities which bear closely on the welfare of the rural population. At the same time, artisans and others, according to their community of interest, will enter into cooperative associations which seek to serve their special needs. Programmes for land reform and for village and small industries, development of panchayats and the fundamental emphasis in community development on the obligations and functions of the community, all point in these directions. In due course, as the agricultural base is strengthened and efforts to diversify the occupational structure of rural areas are intensified, an increasing number of cooperative activities will call for organisation for larger areas. Once the processes of social and economic change gather force and the rural community attains higher levels of skill and productivity, cooperation has to meet larger and more complex demands. Diverse forms of cooperative organisation will continue to develop in tune with new needs and possibilities.

4. Over the past year, policies for the development of cooperation have been carefully reviewed in relation specially to the programmes for the Third Five Year Plan. The conclusions reached regarding the lines along which cooperative credit and cooperative farming should be organised form the basis of programmes for the Third Plan. The Third Plan provides for specific programmes for cooperative credit and supplies, for marketing and processing, for consumer cooperatives and for industrial and other cooperatives. These are but different directions of activity, each important in itself, yet forming an integral part of a larger effort aiming at the development of a growing cooperative sector in India's economy.

5. For the development of cooperation, the Third Plan provides Rs. 80 crores as against the estimated expenditure of Rs. 34 crores in the Second Plan.

Cooperative Credit

6. In November, 1958, in its Resolution on Cooperative Policy, the National Development Council agreed that cooperatives should be organised on the basis of the village community as the primary unit, and that responsibility and initiative for social and economic development at the village level should be placed fully on the village cooperative and the village panchayat. The cooperative and the panchayat were to be regarded as the primary agencies for carrying out the community development programme which aims at the improvement of all aspects of rural life through the efforts of the people. The village agricultural plan was

considered to be the foundation of the programme for cooperative development and was to be given the highest priority.

7. Since these decisions were reached, problems relating to the development of cooperative credit in the context of the larger needs in the Third Plan were examined by the Committee on Cooperative Credit. In September, 1960, the National Development Council considered proposals based upon the report of this Committee, and agreed that while, as a general rule, cooperatives should be organised on the basis of the village community as a primary unit, where villages were too small, the number of villages to be served by a cooperative society could be increased in the interest of viability. The aim should be to ensure viability with the inclusion of the smallest number of villages necessary, so that cooperative societies could achieve both viability and the essential characteristics of cooperation, namely, voluntary basis, close contact, social cohesion and mutual obligation. However, such extension should be subject to certain maximum limits, namely, a population of 3000 (that is, 600 families or about 500 cultivators' families) and a distance of not more than 3 or 4 miles from the headquarters village.

The broad test of viability should be the ability on the part of a cooperative society to meet the requisite expenses without depending upon financial assistance from Government except for a limited period. However, potential viability should always be assessed on the basis of a programme for fulfilling certain essential conditions, such as bringing into the cooperative all rural families, effective implementation of the village agricultural production plan, linking credit with production and with marketing, supervision of the use of credit, undertaking the functions of distribution and supply, and attracting local savings to the maximum possible extent as share capital and as deposits. While a population of 3000 might ordinarily be too high for a primary village society, it was considered desirable to avoid laying down unduly rigid rules on the subject of organisation and size of cooperative societies. Within this broad framework, cooperative societies should be allowed to develop on their own. Particular care should be taken to ensure that existing societies were not interfered with merely because they did not strictly comply with the pattern of organisation now envisaged. The aim should be gradually to fit them into the new arrangements.

8. The pattern of organisation set out above was to be supported under appropriate conditions by State participation in share capital. The State could participate in the share capital of a primary society only if 60 per cent of the members desired this, and the proposal was supported by the central bank to which the society was affiliated. The State's contribution had to be matched in equal measure by the members of the society, the maximum contribution from the State being generally placed

at Rs. 5000 and, in exceptional circumstances, at Rs. 10,000. The amount to be provided by the State could be retained for a period of 5 to 8 years and retired later. As a normal rule, State participation in primary societies should be indirect, that is, through apex and central cooperative banks. Where, for special reasons, State participation in share capital is direct, nomination of directors to the managing committees of primary societies should be avoided. If such nomination is considered essential, the authority to nominate directors should be delegated to central cooperative banks.

To enable cooperative societies to admit all classes of cultivators, including marginal and sub-marginal cultivators, landless tenants, etc. as members, and provide them with adequate credit on the basis of their production requirement and repaying capacity, it was also agreed that State Governments should make an outright contribution to the funds of each society at 3 per cent of the additional loans made during the year over those advanced by it in the preceding year. An outright contribution of 1 per cent to bad debt reserves should be made to central cooperative banks in respect of the additional finance provided by them. In the intensive agricultural districts, where credit is sought to be made available to the full scale of production requirements, the outright grants are at a slightly higher level, being 4 per cent for primary societies and 2 per cent for central banks. The continuance of these outright grants is contingent on the condition that the weaker sections of the community, who have hitherto been unable to get adequate credit, should now receive the necessary assistance. The outright grants received by primary societies and central banks were to be credited by them to special bad debt reserves which would be in addition to the normal bad debt reserves created from profits. It is envisaged that at an appropriate stage, a careful assessment of the extent to which outright grants have led to the extension of credit facilities, should be undertaken.

9. Besides participation by the States in the share capital and outright grants for special bad debt reserves, new service cooperatives and existing cooperatives which take up approved programmes for strengthening and revitalisation, increase of membership, share capital, linking credit with marketing, etc. receive a management grant upto a maximum of Rs. 900 spread over a period of 3 to 5 years. The management grant is intended to be given only to those societies which actually undertake various service functions, namely, disbursement of credit, supply of production requisites, and arrangements for marketing of agricultural produce.

10. Over the period of the first two Plans, the number of primary agricultural credit societies has risen from about 105,000 to about 210,000. and their membership has gone up from 4·4 million to about 17 million. Over this period the total loans advanced by primary agricultural societies have risen from about Rs. 23 crores to about Rs. 200 crores. As the

following statement will show, progress during the Second Plan was more marked than during the First.

Progress of primary agricultural credit societies—First and Second Plans

period	societies (numbers)	membership (million numbers)	short and medium-term loans advanced (Rs. crores)
First Plan			
1950-51	104998	4·4	22·9
1955-56	159939	7·8	49·6
Second Plan			
1956-57	161510	9·1	67·3
1957-58	166543	10·2	96·1
1958-59	182905	11·9	125·5
1959-60	203172	14·4	169·1
1960-61 (estimates)	210000	17·0	200·0

During the Second Plan, in respect of long-term credit, the amount of loans outstanding increased from about Rs. 13 crores to about Rs. 34 crores.

11. In formulating programmes for the expansion of cooperative credit during the Third Plan, the main consideration has been to ensure adequate support to the effort to achieve the large agricultural targets set in the Plan. The Plan envisages that the membership of primary cooperative societies will increase to about 37 million covering about 60 per cent of the agricultural population. The number of societies is expected to increase to about 230,000 so as to serve all the villages in the country. It is estimated that the total amount of short and medium-term credit may increase to about Rs. 530 crores and that of long-term credit (loans outstanding) to about Rs. 150 crores. Statements I and II in the Annexure set out briefly the existing position in respect of short and medium-term credit and long-term credit in different States at the end of the Second and Third Plans.

12. The agricultural programmes in the Third Plan lean heavily on the success of schemes for strengthening the cooperative movement. Of about 160,000 primary societies existing at the end of the First Plan, a large proportion were functioning in a dormant or in a poor state. In the course of the Second Plan about 42,000 societies were taken up for revitalisation. Programmes for the Third Plan provide for the revitalisation of about 52,000 primary societies. Revitalisation of the older societies which were functioning badly and the further expansion of the movement will depend largely on the extent to which primary credit societies succeed in increasing their membership, mobilising local savings, improving management and linking credit with marketing and with production. These measures are essential for strengthening the internal

resources of the credit organisations, both at primary and at higher levels. In those States in which the cooperative movement has remained weak, it is important to undertake the necessary consolidation or revitalisation as a first step in implementing programmes for the Third Plan.

13. The Plan visualises a large increase in the internal resources of the cooperative movement at various levels. Thus, the share capital of primary cooperatives (other than State contribution) is expected to increase from about Rs. 42 crores in 1959-60 to Rs. 85 crores in 1965-66, in central cooperative banks from about Rs. 23 crores to about Rs. 62 crores, and in apex banks from about Rs. 9 crores to about Rs. 33 crores. It is also estimated that between 1959-60 and 1965-66, deposits of primary cooperative societies should increase from about Rs. 12 crores to about Rs. 42 crores, of central banks from about Rs. 95 crores to about Rs. 212 crores and of apex banks from Rs. 60 crores to Rs. 142 crores.

14. Short and medium-term credit provided by service cooperatives caters to the current needs of production. Credit for longer periods for increasing the productive capacity of land is equally essential. This need has to be met in the main by cooperative land mortgage banks. At the end of the Second Plan almost all the States had central land mortgage banks or special land mortgage banking department attached to the apex cooperative bank. In 1959-60 there were 407 primary land mortgage banks. To these it is proposed to add 265 new primary land mortgage banks during the Third Plan. Debentures constitute the principal source of funds for loans advanced by central land mortgage banks either directly or through their affiliated primary banks. The achievement of the target for long-term credit to the extent of Rs. 150 crores (loans outstanding) will depend to no small extent on the support which land mortgage banks receive from institutional investors and the success of rural debentures. In this field a very large measure of assistance has to come from national institutions like the Reserve Bank of India, the State Bank of India and the Life Insurance Corporation.

15. With a view to augmenting the resources available for long-term loans, a proposal for setting up an Agricultural Development Finance Corporation is at present being considered by the Reserve Bank of India in consultation with the Central Government. The Corporation will purchase debentures floated by central land mortgage banks in the normal course and will also provide funds for schemes for increasing agricultural production which are remunerative in character, but involve considerable investment or long periods of waiting, such as rubber, coffee, cashewnut and arecanut plantations, irrigation, contour-bunding and soil conservation, and development of orchards and fruit gardens. The loans advanced by the Corporation will be channelled through the central land mortgage banks.

16. The Reserve Bank of India has played a very significant part in the building up of the cooperative movement during the first two Plans through its supervision over financial institutions, arrangements for training, loans to States for participation in the share capital of cooperative banks, and advances to cooperative banks, its loans outstanding having risen from about Rs. 14 crores in 1955-56 to about Rs. 85 crores in 1959-60. In keeping with the growing requirements of the economy and the agricultural objectives and credit needs in the Third Plan, the Reserve Bank will be called upon to play an even larger role. The Bank has necessarily to relate its advances to the financial strength and administrative efficiency of the borrowing institutions and, at the same time, to take account of factors such as supervision of the utilisation of loans, and past performance in their recovery. It has also to consider the extent to which the cooperative structure in each State succeeds in mobilising deposits and in building up its own resources. Special efforts are being made by the Reserve Bank to assist the State Governments in reorganising the financial structure of the cooperative movement in States in which inadequate progress has been made during the first two Plans.

17. The State Bank of India has also been of considerable assistance to the cooperative movement. Following a policy of responsiveness to the financial needs of cooperative institutions, specially those engaged in marketing and processing, the State Bank has provided free remittance facilities and loans on easy terms and conditions. It has also given support to the operations of land mortgage banks by subscribing to debentures issued by them from time to time and affording interim accommodation for short periods pending the floatation of debentures. With the enlargement of operations of marketing and processing societies, on the one hand, and extension of the network of the offices of the State Bank and its subsidiaries on the other, the policies and procedures which have been evolved should enable the Bank to expand its assistance to cooperatives on a much larger scale during the Third Plan.

Cooperative Marketing

18. Development of cooperative marketing was given a place of special importance in the scheme of integrated rural credit recommended in the Rural Credit Survey. Primary marketing societies were to be established at important markets or at other suitable centres and primary agricultural credit societies were to be affiliated to them. Marketing societies were to be assisted with personnel and the State was to participate in their share capital. Broadly on these lines, during the Second Plan, 1869 primary marketing societies have been assisted through the National Cooperative Development and Warehousing Board. With the addition of about 600 more primary marketing cooperatives proposed to be set up during the Third Plan period, there will be a marketing society at or

near each of the 2500 mandis in the country. Besides these marketing societies, reference may be made to sugarcane supply societies which exist in large numbers, particularly in Bihar and Uttar Pradesh, cotton ginning and pressing societies which have developed most successfully in Gujarat and Maharashtra, and milk supply unions and societies which have come up in recent years in several States.

19. In addition to their role in the sale of agricultural produce on terms favourable to the producer, marketing societies are intended to serve as distributors of articles required by cultivators for agricultural production. They are also essential for linking up the grant of agricultural credit with marketing. Statistics concerning the activities of marketing societies are inadequate in several respects. However, it is estimated that the total volume of agricultural business conducted by marketing societies may at present be of the order of Rs. 200 crores. Their marketing operations are expected to rise to about Rs. 400 crores. Efforts will be directed towards handling by cooperatives of a steadily increasing proportion of the marketable surplus of foodgrains and commercial crops. Participation by cooperatives in the export trade will also be encouraged. Marketing societies receive finance from cooperative financing agencies and also to an increasing extent from the State Bank of India. Their principal problems are to secure sufficient finance for current operations, to improve management and to ensure continued support from their members. Price stabilisation policies will greatly facilitate the growth of cooperative marketing and the expansion of credit. At the instance of the National Cooperative Development and Warehousing Board, the special problems of cooperative marketing in relation to jute in West Bengal, wheat in Rajasthan and paddy in Andhra Pradesh are at present being investigated.

The programme for the construction of godowns at mandi centres and rural godowns is closely linked with the programme for marketing. In the course of the Second Plan, about 1670 godowns have been set up; about 980 additional godowns are expected to be established during the Third Plan. At the end of the Second Plan, about 4100 rural godowns had been set up. Their number is expected to rise by about 9200 during the Third Plan.

Cooperative Processing

20. Development of cooperative processing is essential not only for increasing rural incomes and facilitating credit for production but also for building up a cooperative rural economy. Where cooperative processing units have been successfully established, they have proved invaluable as instruments of development in several allied fields. Cooperative processing is, however, a recent development. Comparatively greater progress has been achieved in sugar and cotton ginning and pressing than in

other processing industries. By 1960-61, 30 cooperative sugar factories out of a total of 41 were in production. In the course of the Third Plan, depending upon factors governing the progress of the sugar industry as a whole, about 25 cooperative sugar factories may be established. The Industrial Finance Corporation has greatly contributed to the development of the cooperative sugar industry. In the Third Plan, besides continuing to assist cooperative sugar factories, the Corporation should be able to extend its support to the development of cooperative processing in other fields. An important recent development is the setting up of the National Federation of Cooperative Sugar Factories with the object of improving operational efficiency of existing factories and promoting new units.

In the course of the Second Plan, 378 cooperative processing units other than sugar factories were assisted. These included 84 cotton ginning and pressing units, 109 rice mills and hullers, 20 oil mills, 17 jute baling plants, 26 groundnut decorticators and 122 other units. Programmes drawn up for the Third Plan include the setting up of 783 cooperative processing units. These comprise 48 cotton ginning and pressing plants, 36 rice mills, 29 jute baling plants, 33 oil mills, 63 groundnut decorticators, 77 fruit-canning units, 411 rice hullers and 86 other units.

21. The rapid development of the cooperative sugar industry in recent years suggests a twofold approach to the organisation of cooperative processing units in other fields. In the first place, it would now be desirable to formulate overall programmes regarding the number of new units in each branch of industry which are required in consequence of increase anticipated in the production of agricultural raw materials and in the consumption of the final product. Within this plan, the share of expansion to be assigned to the cooperative sector should be determined on broad considerations. To facilitate the working out of specific proposals, designs of plants, estimates of investment and working costs and other technical data should be made readily available. At the same time, as in the case of cooperative sugar factories, arrangements for financing other types of processing units should be indicated, the contribution expected from growers, State Governments, State Financial Corporations and other institutions being stated specifically in advance. Arrangements on these lines should be evolved in the near future by the Central and State Governments in consultation with the National Cooperative Development and Warehousing Board. Against this background, as an aspect of local planning and with a view to strengthening the rural economic structure in each district in its cooperative aspects, concrete proposals should be invited. Given the necessary conditions, there is vast scope for the development of cooperative processing not only in relation to new units but also, progressively, by way of reorganisation on cooperative lines of units which are, at present, privately owned. This latter aspect is important on wider considerations, both because it is the aim of public

policy to reorient the organisation of processing industries from a private to a cooperative basis, and because in many of these industries there is at present either excess capacity or only limited scope for adding to existing capacity. It is essential that proposals for expanding processing industries should be coordinated with programmes for the related village industries. In the organisation of large cooperative undertakings, for processing and other purposes, attention should also be given to the position of workers and employees. They should have the opportunity to participate in the management of the cooperative enterprises in which they serve.

Cooperative Farming

22. The role of cooperative farming in the reconstruction of the rural economy was stressed both in the First and in the Second Plan. The goal indicated in the Second Plan was that such essential steps were to be taken as would provide sound foundations for the development of cooperative farming, so that over a period of ten years or so, a substantial proportion of the agricultural lands were cultivated on cooperative lines. With the growth of population and the need to secure rapid increase in agricultural production and rural employment, it is essential to intensify efforts to develop cooperative farming throughout the country and to realise as speedily as possible the objective set in the Second Plan. In the main, cooperative farming has to grow out of the success of the general agricultural effort through the community development movement, the progress of cooperation in credit, marketing, distribution and processing, the growth of rural industry, and the fulfilment of the objectives of land reform. The contribution of cooperative farming to rural progress will be significant in the measure in which it develops as a voluntary mass movement under genuine local leadership and as a logical growth of community development and cooperation at the village level. Given the approach of community development and the acceptance by the village community of its responsibility for the welfare of all its members, the main problems of cooperative farming are organisational, technical and educational. The problems of internal management with which many cooperative farming societies are faced need to be studied systematically and practical solutions appropriate to different regions found for them.

23. These problems were reviewed in general terms by the Working Group on Cooperative Farming which surveyed a number of existing cooperative farming societies and, in addition to recommendations regarding organisation and patterns of assistance, suggested a scheme of pilot projects which is intended to lead the way towards a more rapid expansion of cooperative farming. Proposals formulated with reference to the recommendations of the Working Group were considered by the National Development Council in September, 1960. The Council decided upon the broad principles guiding the organisation of cooperative farming societies and the assistance to be given to them.

For implementing the programme of cooperative farming, the Ministry of Community Development and Cooperation have constituted a National Cooperative Farming Advisory Board. Similar Boards have been set up in some of the States. The Working Group on Cooperative Farming had suggested 3200 cooperative farming societies being set up as pilot projects, roughly 10 in each district, and these constitute the first phase in the development programme for cooperative farming. For carrying out the programme during the first year of the Third Plan, 65 pilot districts have been recently selected. An extensive programme for orienting official and non-official workers is being carried out. Besides the pilot projects, State Governments will continue to assist cooperative farming societies which are formed on a voluntary basis.

24. In the general pattern of organisation which has been proposed for the development of cooperative farming, stress is laid on the principle that cooperative farming is a voluntary movement and there should be no question of compelling any cultivator to join a cooperative farming society. Membership in cooperative farming societies should be confined to those who are prepared to work on the farm or in ancillary activities and, ordinarily, absentee landholders should not be admitted as members. Persons who are prevented from participation in farm work on account of physical disability, Government service, age, sex or because they have land in more than one village may be admitted, although they may not be participating in farm work but, taken as a group, such persons should not exceed one-fourth of the total membership.

The question of the size of cooperative farms has to be considered from two aspects, firstly, from the point of view of securing an area which will make for economic operation and, secondly, from the point of view of how best cooperative farming should be developed so as to secure the development of the village economy as a whole on the lines visualised in the Five Year Plans. While no maximum size for a cooperative farm is proposed, for the purpose of special assistance from the Government, States may prescribe suitable minima in terms of membership and area.

Members joining a cooperative farming society are expected to pool their lands for a minimum period of five years, withdrawals during this period being permitted in exceptional circumstances. Cooperative farming societies are expected to give a reasonable return on account of land contributed by members in addition to income in lieu of work done by them. While consolidation of holdings is not a condition precedent to cooperative farming, it has been suggested, that advantage should be taken of consolidation proceedings to encourage cooperative farming. Owners of small holdings should be specially assisted to come into cooperative farming societies.

25. In the pilot projects as well as in other cooperative farming societies which may be selected for assistance, provision is made for medium

and long-term loans to the extent of Rs. 4000 and loan and grant for a godown-cum-cattle shed, upto Rs. 5000 and also a management grant of Rs. 1200 spread over a period of 3 to 5 years. In the pilot projects provision is made for State participation in share capital, specially in cooperative farming societies which are composed predominantly of landless labourers and marginal and sub-marginal farmers. Such participation is subject to a ceiling of Rs. 2000 which should, as a rule, be matched by an equal contribution on the part of members and is intended to be retired over a period of 10 years. Besides, a measure of preference is to be accorded to cooperative farming societies in making financial assistance available both from provisions in community development blocks and from those relating to agricultural programmes. In addition to the provision of about Rs. 6 crores for pilot projects in cooperative farming in the plans of States, an allotment of Rs. 6 crores has been set apart at the Centre for assisting the development of other cooperative farming societies. With greater progress in the development of cooperative farming there should be no difficulty in making available such additional resources as are required for supporting the effort. As the Plan proceeds, in the light of practical experience in the pilot areas and elsewhere, it is hoped to formulate more comprehensive programmes for promoting cooperative farming.

Consumer Cooperatives

26. A large number of consumer stores came into existence for the distribution of controlled commodities during and after the second world war. In 1951-52 there were 9757 primary stores with a membership of 1·85 million and a total business exceeding Rs. 82 crores. However, in later years many of these stores were wound up. In 1959-60, there were 7168 primary stores with a membership of about 1·4 million and a total paid up capital of Rs. 2·4 crores. Of these stores less than a third were running at profit. Programmes for the Third Plan provide tentatively for assisting 50 wholesale stores and 2200 primary consumer stores. These targets will, however, need further consideration in the light of the recent report of the Committee on Consumer Cooperatives set up by the National Cooperative Development and Warehousing Board. The Committee suggests in each State an apex wholesale store linked with primary stores mainly in the urban areas and considers that at this stage for areas smaller than a State there may not generally be sufficient business to justify a wholesale store. The Committee has also suggested participation by the State in the share capital of the apex wholesale store and the primary stores. There is both urgent need and considerable scope for the development of a successful consumer cooperative movement, specially in the urban areas, but so far the movement has lagged behind. For rural areas, the distribution of essential consumer goods would fall legitimately within the functions of the service cooperative, arrangements for supply of goods being made ordinarily through the

marketing societies. In the rural areas, the supply of manufactured consumer goods of standard variety which are in common demand could well be a subsidiary function of primary marketing societies or such other agencies as may already exist. Conditions for the development of consumer cooperatives in the Third Plan are generally favourable and, if special efforts are made, rapid progress can be achieved. They will be of the greatest help not only in the stabilisation of retail prices but also in preventing the evils of adulteration in foodstuffs.

Industrial Cooperatives

27. Industrial cooperatives have had a large measure of success in the handloom industry, in coir and in certain village industries. However, their expansion as a general movement has been impeded on account of various practical difficulties. Following the Resolution of the Government of India on Industrial Cooperatives in November, 1959, a series of decisions have been taken which, given the necessary climate and leadership, should facilitate the development of industrial cooperatives during the Third Plan. Industrial cooperative societies are at present following three broad patterns. In some, the members undertake production on their own account and cooperate for certain services such as supply of raw materials, etc. In others they jointly undertake production, marketing and other related activities. In the third group are societies whose members may work separately, but set up cooperative workshops for specific services. In industries like handloom and village industries, as also in several small scale industries, there is great scope for bringing the workers together into a cooperative. Over a large area in the field of small scale industries, however, there is likely to be greater opportunity for organising cooperatives for such objects as providing common facilities, initial processing of raw materials, specialised processing, joint handling of orders, and marketing.

28. Although the plans of States provide for several schemes for encouraging industrial cooperatives, assisting artisans, etc., efforts in these directions need to be intensified further during the Third Plan. At the present stage of development, the important consideration is that effective use should be made of the available concessions and facilities for the formation of industrial cooperatives which have now been evolved so as to strengthen the existing cooperatives and to encourage the organisation of new ones on sound lines, and to concentrate on the solution of practical problems of finance and marketing. Among decisions which have been taken with the object of stimulating the growth of industrial cooperatives as a normal pattern of organisation, special reference may be made to the following:

(1) loans for working capital at a concessional rate of interest from Government and central cooperative agencies;

(2) loans to members of industrial cooperative societies for subscribing to share capital;

(3) grants for managerial staff, improved tools and equipment;

(4) subsidising for a limited period specified managerial and supervisory staffs of cooperative banks;

(5) sharing of expenditure with State Governments on additional staff appointed to look after the development of industrial cooperatives; and

(6) guarantee of advances sanctioned by cooperative financing agencies to industrial cooperative societies for a limited period.

On present indications the number of industrial cooperatives in the Third Plan may increase from about 30,000 to about 40,000, their membership rising from over 2 million to about 3 million and their share capital from about Rs. 10 crores to about Rs. 20 crores. It is desirable that in the light of recent decisions, the Central and State Governments should take steps to prepare further and more specific proposals for the development of industrial cooperatives and should ensure that they receive the necessary support from Government agencies, the All-India Boards and various financial institutions in spreading their activities.

Labour and Construction Cooperatives

29. The importance of organising labour cooperatives for carrying out irrigation and other projects in rural areas has been stressed frequently since the First Plan. In several States, notably in Punjab, Bombay, Andhra Pradesh and Rajasthan, efforts have been made to set up labour cooperatives, labour contract societies, etc. for taking up works involving mainly unskilled and semi-skilled labour with a view gradually to diminishing the role of contractors. In works programmes for the utilisation of rural manpower to be undertaken in the Third Plan also, labour cooperatives will be required to play a major part. While the policy of entrusting construction works to the extent possible to cooperatives and; where they exist, to voluntary organisations has been accepted, the administrative measures required to give effect to it need to be evolved in greater detail.

30. Labour and construction cooperatives and voluntary organisations can be entrusted with advantage with works under the following categories:

(1) earth-work of all types and simple masonry works relating to multipurpose, major and medium irrigation works and flood protection schemes, minor irrigation works and construction of roads;

(2) simple Government buildings such as hostels, administrative blocks, workshops, residential tenements, school buildings and other local development works in rural areas; and

(3) supply in bulk quantities of building materials such as stones, stone blasts, shingle and sand.

To enable genuine labour cooperatives and voluntary organisations to undertake these works, certain administrative conditions have to be fulfilled, the more essential of these being the following:

(1) setting apart a certain proportion of the available construction work for cooperatives and voluntary organisations, the quantum being extended as the capacity of these organisations develops;

(2) ensuring continuous flow of work, the magnitude, types and the specific works to be awarded being indicated well in advance;

(3) giving works to cooperatives and voluntary organisations in preference to private contractors and, wherever possible, on a negotiated basis;

(4) award of works at "workable rates" on the basis of schedules of rates, which may be increased or decreased by a percentage to be decided by the competent authority, the work order system being preferred wherever possible;

(5) avoidance of delays in payments and authorisation of "on account payments" for works completed;

(6) making technical personnel available for work with cooperatives and voluntary organisations; and

(7) assistance by way of loans for working capital and purchase of equipment.

In the light of the experience which different States have already gained of the working of labour cooperatives. suitable organisational patterns should be evolved.

The aim should be to build up labour cooperative organisations and voluntary organisations as important instruments for undertaking development and providing employment through works carried out mainly on behalf of Government Departments, Panchayat Samitis and Panchayats. Once such organisations come into existence, new possibilities for enlarging their scope and extending their benefits to the community in many directions will emerge.

HOUSING COOPERATIVES

31. In 1959-60 there were 5564 cooperative housing societies with a total membership of 322,000. Housing cooperatives constructed 45.000 houses in 1959-60 as compared to 44,000 in 1958-59 and 36,000 in 1957-58. Under different housing schemes which are at present being undertaken, facilities are provided for the setting up of housing cooperatives. For

instance, the subsidised industrial housing scheme allows for a subsidy up to 25 per cent of the cost in the case of cooperatives of industrial workers. Under the low income group housing scheme as well as other schemes which are being undertaken in a number of growing towns, cooperatives are either allotted land on favourable terms or assisted in acquisition of private lands. The village housing scheme also provides for the setting up of housing cooperatives in selected villages and for the production of bricks, doors, windows and other components. These various provisions need to be used purposefully and as a matter of sustained policy so that, in towns and villages alike, an appreciable impact can be made on the improvement of housing and living conditions. The proposal in the Third Plan to set up a Central Housing Board and to promote the establishment of Housing Boards in the States will make it possible to channel larger funds to housing cooperatives. With the preparation of interim general plans and master plans for a large number of towns and of lay-out plans for selected villages as visualised in the Chapter on Housing, it will become easier to implement effectively the policy of supporting and developing housing cooperatives on a large scale during the Third Plan.

Other Non-Credit Cooperatives

32. In addition to the various types of cooperatives discussed above, reference may be made to cooperatives engaged in the supply of sugarcane and milk and in the development of fisheries and dairying and to cooperative cold storages. Sugarcane supply societies account for a total membership of 2·34 million, milk supply societies for 233,000 and fisheries societies for 220,000. By the end of Second Plan 16 cold storages were established; 33 more will be set up in the Third Plan. The Third Plan includes large programmes for fisheries development and dairying. These are fields of great promise for the development of cooperative activity. Transport cooperatives should also be encouraged as a means of providing new opportunities for educated unemployed persons. The principle of cooperation can be extended to a growing range of new activities in industry and services, such as, manufacture of implements, printing, supplies of raw materials, provision of common facilities, etc. In the tribal development blocks and in areas predominantly inhabited by scheduled tribes, there is considerable scope for building up cooperatives, specially for working forest areas and developing the traditional crafts. The Central Government have recently set up a committee to consider the lines along which procedures and legislation relating to cooperation should be adapted to meet the special conditions and requirements of tribal areas.

Cooperative Training and Administration

33. The role of trained personnel in the efficient execution of cooperative programmes was emphasised in the Rural Credit Survey, and in

recent years there has been considerable development of training facilities for cooperative personnel. At the end of the Second Plan, besides the Cooperative Training College at Poona for training senior staffs of Cooperative Departments, there were 13 regional centres for intermediate and block level cooperative officers and 62 cooperative training centres for junior personnel. Special courses for land mortgage banking and marketing have also been organised at the intermediate training centres. By the end of the Second Plan, the numbers trained included 543 senior personnel, 3417 block level and intermediate officers, 34,000 junior personnel and 382 in courses for land mortgage banking and 1253 for cooperative marketing. The All-India Cooperative Union and State Cooperative Unions have organised 368 peripatetic parties for the training of office-bearers, members of managaing committees and members of primary cooperatives. In these categories, about 28,500, 12,000 and 726,000 persons respectively were trained by the end of the Second Plan.

34. For the Third Plan, the programmes drawn up by the States envisage, amongst other steps, the addition of 13 schools for training junior cooperative personnel and the continuance of the scheme for the education of members of cooperative societies through peripatetic parties. The Study Team on Cooperative Training, constituted by the Ministry of Community Development and Cooperation, which has recently submitted its proposals, contemplates increase in the number of centres for training intermediate personnel to 15 and in the number of centres for junior cooperative personnel to 120. These and other recommendations of the Team are at present under consideration.

35. Steps have been taken during the Second Plan to strengthen the State Cooperative Departments, in particular, for such functions as audit, supervision and inspection. In the Third Plan a further provision of about Rs. 5 crores has been made for strengthening the personnel of Cooperative Departments at different levels.

36. In planning and carrying out intensive development in rural areas, Panchayati Raj institutions and cooperative organisations have a complementary role and must cooperate closely at every step. Zila Parishads, Panchayat Samitis and Village Panchayats should promote the development of cooperatives and should endeavour to create a climate of community effort and social responsibility such as are vital for the successful functioning of cooperatives at all levels. Regulatory powers in relation to cooperative organisations may continue to remain with the Government, but some of them can be delegated progressively to federal cooperative organisations. These will help to build up the self-regulatory character of the movement and to promote local leadership.

37. Cooperation is a people's movement and initiative for cooperative development and responsibility for regulating the working of the movement should progressively devolve on cooperative institutions and their

higher federal organisations. The building up of efficient federal organisations in all sectors of cooperative activity assumes great importance in this context. As these organisations grow in strength, more powers may be transferred to them and the departmental machinery may limit its activities to the minimum statutory duties of registration, audit, arbitration and inspection. Promotional work relating to cooperation, cooperative training, education and publicity are activities falling within the special province of cooperative unions. Cooperative unions at State and district levels should be strengthened to enable them to undertake these responsibilities, and a strong federal structure should be built from the ground.

ANNEXURE

Statement I—Primary agricultural credit societies

State	total number of societies on June 30, 1960	proportion of societies working at a loss (1959-60)	overdues as proportion of outstandings (June 30, 1960)	revitalisation of societies: Second Plan (estimated)	revitalisation of societies: Third Plan (programme)	short and medium term loans (Rs. in lakhs): 1959-60 (advanced)	short and medium term loans (Rs. in lakhs): 1960-61 (estimated)	short and medium term loans (Rs. in lakhs): 1965-66 (programme)	number of members (thousands): 1959-60	number of members (thousands): 1960-61 (estimated)	number of members (thousands): 1965-66 (programme)
1	2	3	4	5	6	7	8	9	10	11	12
Andhra Pradesh	12527	27	14	4000	4000	1750	2000	6000	1262	1500	4000
Assam	3070	34	55	2500	..	137	250	800	159	250	800
Bihar	16222	37	55	1580	8000	129	180	1150	706	1000	2000
Gujarat	7053	33	25	5600	1000	2126	2700	5000	750	900	1500
Maharashtra	17816	21	27		3000	2937	3700	10000	1531	1800	4000
Jammu and Kashmir	1294	9	26	425	..	65	100	500	233	300	600
Kerala	2289	34	20	600	1000	409	500	1600	756	850	1500
Madhya Pradesh	20629	16	21	3500	6000	1301	1500	4000	789	900	2000
Madras	9589	24	11	1000	2000	1737	2000	4700	1584	2000	3900
Mysore	8017	25	33	3780	2000	1203	1500	3750	1054	1100	2100
Orissa	6520	35	20	472	2000	235	275	1800	369	500	1800
Punjab	17107	18	26	2750	2500	1129	1300	3000	1126	1240	2100
Rajasthan	9281	13	19	3000	1000	539	650	1800	573	700	2000
Uttar Pradesh	57136	10	6	9500	15000	2922	3400	7000	2883	3300	6500
West Bengal	13076	27	43	2700	4500	227	300	1500	571	700	2000
Union territories	1546	19	18	645	180	64	100	317	137	250	429
total	203172	21	21	42052	52180	16910	20455	52917	14483	17490	37229

ANNEXURE

Statement II—Long-term credit

State	number of banks as on June 30, 1960		long-term loans outstanding (Rs. crores)		
	central land mortgage banks	primary land mortgage banks	1959-60	1960-61 (estimated)	1965-66 (programme)
1	2	3	4	5	6
Andhra Pradesh	2	93	5·89	6·90	23·31
Assam	1	3	0·14	0·17	1·60
Bihar	1	..	0·02	0·10	3·50
Gujarat	1	5	8·30	9·00	20·00
Maharashtra	1	27	3·55	5·00	50·00
Jammu & Kashmir	..	..	..	..	..
Kerala	1	7	1·43	1·50	3·00
Madhya Pradesh	1	20	0·34	0·50	5·00
Madras	1	85	5·16	6·00	14·48
Mysore	1	108	3·12	3·80	10·00
Orissa	1	..	0·57	0·60	2·00
Punjab	1	..	0·37	0·60	2·90
Rajasthan	2	41	0·02	0·15	8·05
Uttar Pradesh	1	6	0·01	0·08	5·00
West Bengal	1	12	0·24	0·25	1·50
Union Territories	1	..	0·01	0·01	0·20
total	17*	407	29·17	34·66	150·54

*Including land mortgage banking department of apex cooperative bank in Madhya Pradesh.

CHAPTER XIV

LAND REFORM

OBJECTIVES FOR THE THIRD PLAN

LAND reform programmes, which were given a place of special significance both in the First and in the Second Plan, have two specific objects, The first is to remove such impediments to increase in agricultural production as arise from the agrarian structure inherited from the past. This should help to create conditions for evolving as speedily as possible an agricultural economy with high levels of efficiency and productivity. The second object, which is closely related to the first, is to eliminate all elements of exploitation and social injustice within the agrarian system, to provide security for the tiller of soil and assure equality of status and opportunity to all sections of the rural population.

2. The principal measures for securing these objectives were the abolition of intermediary or 'rent-receiving' tenures and the reform of tenancy, including regulation and reduction of rent and security of tenure. A further step to which tenancy reform led was the conferment of right of ownership on tenants.

3. In pursuance of the second object, in particular, it was proposed that steps should be taken to reduce disparities in the ownership of land—a policy widely accepted as being essential for the economic development of countries with limited areas of land and large population dependent on it. It was realised that with the existing pattern of distribution of agricultural holdings and the predominance of small farms, redistribution of land in excess of any given level of ceiling was not likely to make available any large results in the shape of surplus land for distribution. It was considered, however, that such reduction in disparities was a necessary condition for building up a progressive cooperative rural economy. At the same time, such redistribution of land as might be possible would, along with other measures which have been taken for resettlement on waste lands, afford a measure of opportunity to the landless section of the population, to whose problems special attention was drawn both in the First and in the Second Plan. It should be stressed that the principles on which the scheme of land reform is based do not merely involve adjustments between the interests of different sections of the population which depend on land, but are part of a wider social and economic outlook which has to be applied in some measure to every part of the economy.

4. It will be seen that, with the implementation of a programme of land reform on the lines described above, the vast majority of cultivators in India would consist of peasant-proprietors. They are to be encouraged and assisted in organising themselves in voluntary co-operative bodies for credit, marketing, processing and distribution and, with their consent, progressively also for production. To the extent such reorganisation is carried out at the village level, some of the difficulties arising from small and uneconomic holdings could be diminished and the weaker in each community could be assisted to raise their standards. It has always been stressed that as each phase of land reform is implemented, it will become possible to give fuller assistance to cultivators in increasing agricultural production and in diversifying the village economy. Greater cohesion among cultivators and the strengthening of the village community will also lead to a larger local effort and more rapid economic and social progress.

5. As legislation has been enacted in one State after another, there has been greater understanding of the need for land reform and the purposes it is intended to achieve. The Bhoodan and Gramdan movements have greatly helped to create a favourable atmosphere for implementing progressive measures of land reform. Yet, the total impact of land reform has been less than had been hoped for. For this there are several reasons. In the first place, there has been too little recognition of land reform as a positive programme of development, and it has been only too often regarded as extraneous to the scheme of community development and the effort to increase agricultural production. Secondly, there has been insufficient attention to the administrative aspects of land reform. Frequently at the lower levels of the administration, collusion and evasion have gone unchecked, and there has been failure also to enlist the support and sanction of the village community in favour of effective enforcement of legal provisions. In the third place, it has not been sufficiently realised that the reform of land tenures and the early enforcement of ceilings are an essential foundation for the building up of the cooperative rural economy. While removing such shortcomings in the legislation or the rules as may come to notice, it is important that the land reform programme should be completed with the least delay, so as to eliminate any feeling of uncertainty arising from delays in implementation. This aspect has been specially stressed by the Panel on Land Reform constituted by the Planning Commission to assist in the study of proposals for the Third Plan.

ABOLITION OF INTERMEDIARY TENURES

6. Work on the abolition of intermediary tenures like zamindaris, jagirs and inams, which covered more than 40% of the area of the country, has been fully carried out except for a few minor tenures such as those held by religious and charitable institutions and service inams. These reforms have brought more than 20 millions of tenants into direct relationship

with the State and improved their social and economic position. As a result of the abolition of intermediary tenures, considerable areas of cultivable waste land and private forests came under the management of Government.

7. Several States with intermediary tenures did not possess the requisite revenue administration. Over the past few years, they have done much to strengthen their revenue agencies but there is need for further improvement, especially at the village level. There has been progress also in survey and settlement and in the preparation of records of rights, but much still remains to be done. Largely on account of the heavy burden thrown on the revenue administration, there has been a measure of delay in the assessment and payment of compensation to intermediaries. Out of a total amount of Rs. 670 crores (Rs. 520 crores as compensation and Rs. 150 crores for interest charges), so far compensation to the extent of only Rs. 164 crores has been paid, mainly in the form of bonds. It is important that in the course of the Third Five Year Plan, all the States concerned should arrange to issue the compensatory bonds still outstanding and complete records of rights and other administrative tasks arising from the abolition of intermediaries.

Reduction of Rents

8. Ten years ago the customary level of rents commonly paid by tenants-at-will, non-occupancy tenants and share-croppers over the greater part of the country was one-half of the produce or more. In addition to rent, very frequently there were other payments which enhanced the burdens borne by tenants. The situation was reviewed at length in the First Five Year Plan which suggested that a rate of rent exceeding one-fourth or one-fifth of the produce would call for special justification. Over the past few years, all States have enacted legislation for regulating rents which a landlord may receive. In some States, as in Gujarat, Maharashtra and Rajasthan, the maximum rent now stands at one-sixth of the produce. In Assam, Kerala, Orissa and Union Territories, the rent payable is about one-fourth of the produce or less. In several States, the normal level of rent is still about a third of the produce. It is to be hoped that in these States rents will be reduced to the level envisaged in the first two plans so as to facilitate more rapid improvement in the economic conditions of tenants.

9. In the early years of tenancy legislation, it was observed that reduced levels of rents—and indeed other conditions of tenancy—provided for by legislation were far from adequately enforced, and to a large extent customary rates of rent continued to prevail. Where arrangements for leasing land are arrived at between individual parties, variations from the norms set by legislation can occur for a variety of reasons, for instance, if the owner undertakes to provide seed or bullocks or pay for irrigation. In the beginning, there is also considerable ignorance on the part of

tenants of the rights granted by legislation. Where there is pressure on land and the social and economic position of tenants in the village is weak, it becomes difficult for them to seek the protection of law. Moreover, resort to legal processes is costly and generally beyond the means of tenants. Thus, in many ways, despite the legislation, the scales are weighed in favour of the continuance of existing terms and conditions. Effective implementation of tenancy legislation, therefore, requires specially vigorous and sustained action on the part of governmental agencies. There must be special efforts not only to acquaint tenants with the rights due to them but also to bring about greater understanding on the part of the people of each area of the objects of land reforms and of the need to complete them without delay.

10. Although, in the past, rents have generally been paid as a proportion of the gross produce, with progress in the rural economy and larger use of money as the medium of exchange, it would be desirable, as a matter of policy, to hasten the transition from rents in kind to cash payments. With cultivators having to purchase a growing proportion of their requirements, such as fertilisers, implements etc., in cash, the changeover to cash rents is likely not only to reduce the burden on tenants, but also to promote investment in agriculture. As suggested in the Second Plan, commutation of rents in kind into cash payments might be facilitated if, with due regard to conditions of each district, rents could be declared as multiples of the prevailing land revenue assessment. Where this is not feasible, suitable norms could be proposed on the basis of other criteria. It would greatly assist the enforcement of rents prescribed by legislation if State Governments could make it obligatory on the part of owners to furnish receipts for the rents received by them and if, as is already the practice in some States, tenants could deposit the rents due from them with the appropriate revenue officer, the land owner being advised accordingly.

SECURITY OF TENURE

11. Legislation providing for security of tenure has been enacted in eleven States and for all the Union Territories. In four States Bills are before the legislature and will be enacted in the near future Pending legislation, ejectment of tenants has been stayed. Legislation for security of tenure has three essential aims—firstly, that ejectments do not take place except in accordance with the provisions of the law; secondly, that land may be resumed by an owner, if at all, for 'personal cultivation' only; and thirdly, that in the event of resumption the tenant is assured of a prescribed minimum area.

12. In the first phase of tenancy legislation it was perhaps inevitable that the provisions regulating the rights of owners and tenants should be somewhat elaborate. Such complexity comes in the way of making

the legislation effective. In the light of the experience gained, it is suggested that steps should be taken to simplify the existing legislation wherever possible, and to strengthen or modify provisions which are in practice difficult to enforce.

13. As stated earlier, the impact of tenancy legislation on the welfare of tenants has been in practice less than was hoped for. One of the principal reasons for this is that in a number of States ejectments of tenants have taken place on a considerable scale under the plea of 'voluntary surrenders'. Two main recommendations on this subject were made in the Second Plan. The first was that voluntary surrenders by tenants of lands held by them should not be regarded as valid unless they were duly registered by the revenue authorities. Secondly, in the event of surrender of tenancy, the land owner should be entitled to take possession of land only to the extent of his right of resumption permitted by law. On the whole, both legislation and administrative action have fallen short of these recommendations. A few States have provided for registration of surrender of land by tenants. Registration of surrenders is essential and a provision on these lines should be a feature of tenancy legislation. The second lacuna in the existing legislation concerns the conditions applicable to surrenders. In two States effect has been given to the recommendation in the Second Plan that resumption of land arising from a voluntary surrender by the tenant should take place on conditions identical with those governing resumption for personal cultivation. In Maharashtra and Gujarat, the overall limit for resumption applies also to surrenders, but other conditions governing surrenders are different. As was pointed out in the Second Plan, most voluntary surrenders of tenancy are open to doubt as bonafide transactions. This has been confirmed by such enquiries and investigations as have been undertaken. It is, therefore, important that early steps should be taken to remove legal and administrative deficiencies relating to the registration of 'voluntary surrenders' and resumption of land arising from them.

14. In most States legislation provides for a definition of 'personal cultivation' which is, as a rule, a necessary condition for resuming land from tenants. There are three elements in 'personal cultivation', namely, risk of cultivation, labour and personal supervision. The obligation of the owner to bear the entire risk of cultivation implies that wages will be paid in cash or in kind, but not as a share of the crop. While the expression 'labour' is generally defined to include 'labour by the owner or by a member of his family', this is not an obligatory element in 'personal cultivation'. In the Second Plan, the proposal was made that where land is resumed on grounds of 'personal cultivation'. it would be desirable to provide for personal labour as a necessary ingredient, in the absence of which the ejected tenant should have the

right of restoration. So far this suggestion has not found its way into the legislation undertaken by the States. A provision on these lines is desirable and would serve to make the legislation more effective. As an essential element in 'supervision', the Second Plan envisaged residence during the greater part of the agricultural season by an owner or a member of his family in the village where the land is situated or in a near-by village within a distance to be prescribed. The Panel on Land Reform has suggested that the condition of residence in these terms should apply during the period the main agricultural operations are undertaken. This suggestion should be considered by State Governments and the current definitions of 'personal supervision' modified to the extent necessary.

Resumption of Tenancies

15. The main recommendations in the Second Plan for regulating resumption of tenancies on grounds of personal cultivation were as follows:

(1) The area to be resumed should be declared within a certain period and should be demarcated in advance.

(2) Owners with very small holdings, for instance, those having one-third of a family holding or less should be free to resume their entire land for personal cultivation. Those with holdings above this level might resume land for personal cultivation subject to a minimum area being left with the tenant.

(3) Right of resumption may be exercised within a period of five years.

(4) Persons serving in the armed forces or those subject to disabilities, like widows, minors or those suffering from mental or physical infirmities etc., should be permitted to lease out land and should have the right to resume land for personal cultivation when the disability ceases.

16. From the tenor of legislation enacted or under consideration, States fall broadly into four categories:

(a) those in which no resumption is permitted, as in Uttar Pradesh, Delhi and, in respect of under-raiyats, West Bengal;

(b) those in which the right to resume a limited area for personal cultivation is allowed subject to the condition that a minimum area or a portion of the holding is left with the tenant, as in Bihar, Gujarat, Kerala, Madhya Pradesh, Maharashtra, Mysore, Orissa, Rajasthan, Himachal Pradesh and Manipur;

(c) those in which the right to resume is subject to the tenant being given alternative land upto a prescribed limit, for cultivation, the land being found by the State, as in Punjab and Assam; and

(d) those in which resumption is allowed up to the level of the ceiling without any minimum area being provided for the tenant, as in Andhra Pradesh and Madras. Bargadars in West Bengal who are crop-sharers, are not regarded as tenants. They do not have the rights extended to under-raiyats, although strictly speaking they fall within the definition of 'tenant'.

17. Experience of the working of legislation relating to resumption on grounds of personal cultivation leads to certain broad conclusions. In the first place, whatever the conditions, the right to resume land creates uncertainty and tends to diminish the protection afforded by the legislation. Both in the First and in the Second Plan, it was contemplated that it would not be necessary to allow resumption beyond a period of five years. It is considered that except for owners holding land equivalent to a family holding or less, in view of the period which has already elapsed, there should be no further right of resumption. Further uncertainty for tenants would not be in the interest of agricultural development. In the second place, small owners, that is, owners with a family holding or less, deserve special consideration. As suggested in the Second Plan, owners with less than a basic holding (that is, one-third of a family holding) should be free to resume their entire area for personal cultivation and to lease out their lands. As regards owners whose holdings lie between a basic holding and a family holding, they may be permitted to resume for personal cultivation, within a specified period, one-half of the area held by the tenant but in no event less than a basic holding. Where a tenant is left without any land or with area smaller than a basic holding the Government should endeavour to find land for him to cultivate. The general aim should be to encourage small owners, and specially those among them with very small holdings, to enter into cooperative farming societies. Membership in a cooperative farming society would enable them to move to other work if they so desire. For such owners it would not be necessary to prescribe a period beyond which resumption for personal cultivation should not be permitted.

18. Provisions regarding resumption for personal cultivation could be abused if medium-sized owners were to act malafide and transfer their lands to relatives or others and so come within the definition of small owners. With a view to ensuring that the provisions for resumption are observed, legislation in Gujarat and Maharashtra was amended

in 1957 so as to restrict resumption in respect of such land as stood in the name of a land holder or any of his ancestors in the record of rights on the 1st day of January, 1952. In the legislation in Kerala which includes special provision for small holders, it has been provided that any transfers or partitions carried out after the 18th day of December, 1957, shall not entitle the land holder or the transferee to the benefit of the provisions for small holders. A condition on these lines would be generally desirable.

RIGHTS OF OWNERSHIP FOR TENANTS

19. Security of tenure and reduction of rents are the first stage in tenancy reform; the goal is to confer rights of ownership on as large a body of tenants as possible. In the Second Plan it was suggested that each State should have a programme for converting tenants of non-resumable areas into owners and putting an end to vestiges of the landlord-tenant relationship. It was urged that instead of optional rights to tenants to purchase lands cultivated by them, all tenants of non-resumable areas should be brought into direct relationship with the State. For owners with holdings equivalent to a family holding or more, a period of five years within which the right of resumption could be exercised was proposed, and it was suggested that on the completion of this period, rights of ownership should be conferred on their tenants. Finally, as it was difficult to obtain precise information regarding the progress made in the transfer of ownership rights to tenants, the recommendation was made that States should arrange to compile regular annual returns.

20. In the course of the Second Plan, some progress has been made in the direction of providing ownership rights to tenants. In a few States as in Punjab, only optional right to purchase has been given to tenants. This is an unsatisfactory approach, for, as was observed in the Second Plan, where rights of purchase are optional, they are scarcely exercised. In a number of States, legislation provides for bringing tenants of non-resumable lands into direct relationship with the Government. This may be achieved in one of the three ways:

(1) by declaring tenants as owners and requiring them to pay compensation to owners in suitable instalments, responsibility for recovering unpaid instalments as arrears of land revenue being accepted by Government;

(2) through the acquisition by Government of the rights of ownership on payment of compensation and transfer of ownership to tenants, compensation being recovered from them in suitable instalments; and

(3) through the acquisition by Government of the landlords' rights and bringing tenants into a direct relationship with the State, option being given to tenants to continue as such on payment of fair rent to the Government or to acquire full ownership on payment of the prescribed compensation.

21. The first of these courses has been followed in Gujarat, Maharashtra, Madhya Pradesh and Rajasthan, the second in Delhi and in respect of under-raiyats (without payment of compensation) in West Bengal, and the third in Kerala and Uttar Pradesh. In Madras, steps in favour of ownership rights for tenants have not yet been initiated. In Assam and Bihar, the right of ownership will be available only to the tenants of land-holders holding more than the ceiling area. As much of the legislation is quite recent, exact information regarding the extent to which ownership rights have been conferred on tenants is not available. It is understood that in Gujarat and Maharashtra, under legislation enacted by the former Bombay State, rights of ownership would accrue to 1·3 million tenants over an area of about 2·4 million acres. In Uttar Pradesh, about 1·5 million sub-tenants and tenants of home-farm lands, holding about 2 million acres, were brought into direct relationship with the State. In the Union Territory of Delhi, ownership of about 25,000 acres was transferred to about 18,000 tenants and sub-tenants.

22. It is recommended that in the course of the Third Plan, steps should be taken to complete the programme for conferring rights of ownership on the tenants of non-resumable lands. With the enforcement of ceilings on agricultural holdings, tenants of owners with lands above the limit of ceiling will, in the ordinary course, become owners of land. It has been suggested earlier that owners holding land exceeding a family holding, as prescribed in different States, should have no further rights of resumption. Tenants of such owners should also become owners of lands held by them. With this object, according to its legislation and other conditions, a State may either acquire the rights of ownership and transfer them to tenants or declare tenants as owners and require them to pay for their rights in instalments on terms prescribed by legislation. On the whole, it would be desirable for payments by tenants for acquisition of ownership to be made directly to Government rather than to the owners. This will ensure more effective implementation and will end the landlord-tenant nexus.

23. The question arises whether rights of ownership should also be conferred upon the tenants of small owners. This would be desirable in principle to the extent of non-resumble lands held by such tenants. However, in view of the large number of petty owners involved, a uniform approach might not be feasible. The problem should be

studied by States in the light of their conditions with a view to determining the action called for in this direction.

CEILING ON AGRICULTURAL HOLDINGS

24. In the course of the Second Plan, there has been legislation for placing ceiling on agricultural holdings in Andhra Pradesh, Assam, Gujarat, Kerala, Madhya Pradesh, Maharashtra, Orissa, PEPSU territory in the Punjab, Rajasthan, Uttar Pradesh and West Bengal and in the Union Territories. Bills proposing, ceilings are at present before the State legislatures in Bihar, Madras and Mysore. In Punjab, outside the area of the former PEPSU territory, the existing legislation permits the Government to utilise land in excess of the permissible area for the purpose of resettling tenants who have been ejected or may be ejected. Annexure I of this Chapter sets out in summary form information relating to the levels at which ceilings have been prescribed or proposed in different States. With the completion of legislation, the essential task must be that of ensuring speedy and effective implementation.

25. The question whether ceilings should apply to the holding of an individual owner or to the aggregate area held by the members of a family was considered in the Second Plan. As is to be expected, practice in this respect differs. In several States, as in Andhra Pradesh, Jammu and Kashmir, Orissa, Punjab, Uttar Pradesh and West Bengal the ceiling applies to individuals without any special provision being made for joint Hindu families. In Madhya Pradesh, while the ceiling applies to individuals, in the case of a joint Hindu family each co-sharer is entitled to a separate ceiling area. In Assam, Gujarat, Kerala and Rajasthan, the ceiling applies to the aggregate area held by a family, the expression 'family' being defined in the legislation. A similar approach has been adopted in the legislation now under consideration in Madras and Mysore. Thus different States have applied ceilings to individuals or families as they considered appropriate to their conditions.

26. Once legislation has been enacted, amendments should aim primarily at eliminating deficiencies and facilitating implementation rather than at introducing fundamental changes in the principles underlying the legislation. In this context, the most important issue for consideration is the treatment of transfers of land on the part of land owners subject to ceilings. On the whole, it would be correct to say that, in recent years, transfers of lands have tended to defeat the aims of the legislation for ceilings and to reduce its impact on the rural economy. The question as to whether or not transfers should be disregarded and, if so, from what date, has been debated at length in every State. In the majority of States a date prior to the enactment of the

legislation has been indicated. This may be the date of the introduction of the Bill providing for ceilings or of its publication or other specified date. In several States transfers subsequent to this date are disregarded as in Assam, Gujarat, Kerala, Madras, Maharashtra, Rajasthan, Uttar Pradesh and West Bengal. In a few States, there is no such provision at all, as in Andhra Pradesh. In Madhya Pradesh and Orissa, legislation allows the owners of surplus lands to dispose of them to persons belonging to certain prescribed categories even after the enactment of the legislation.

27. Since many of the transfers are apt to take place between members of the family, it has been suggested that the ceiling should apply invariably to the aggregate area held by a family rather than to individuals. However, in view of the fact that ceilings have been applied in several States to individual holdings and in others to the aggregate area held by a family, any attempt to remove deficiencies or weaknesses would have to fit into the pattern of the prevailing legislation. The question of transfers could perhaps be dealt with in the following manner:

(1) Where legislation does not contain a provision for disregarding transfers, in view of the fact that transfers have taken place on a considerable scale, a suitable date subsequent to which transfers are disregarded may be proposed, if necessary, through an amending legislation. This date may be the date of the publication of the ceiling proposals or an earlier date as may be prescribed in view of the local conditions.

(2) In respect of transfers made after the specified date, a distinction may be made between (a) transfers among the members of a family, (b) benami transfers and other transfers which have not been made for valuable consideration and through a registered document, and (c) transfers made for valuable consideration through a registered document. Transfers coming under (a) and (b) can be disregarded. Transfers falling under (c) may need to be dealt with differently in view of the fact that the transferees may be small owners or landless persons who may have purchased some land. It may be necessary to protect such transferees, at any rate, upto a prescribed limit, say, a family holding.

(3) There should be provision for a review of transfers by a competent authority on the lines suggested above.

EXEMPTIONS FROM CEILINGS

28. The Second Plan envisaged exemption from ceilings for the following categories of farms:

(1) tea, coffee and rubber plantations;

(2) orchards where they constitute reasonably compact areas;

(3) specialised farms engaged in cattle-breeding, dairying, wool-raising, etc.;

(4) sugarcane farms operated by sugar factories; and

(5) efficiently managed farms which consist of compact blocks, on which heavy investment or permanent structural improvements have been made and whose break-up is likely to lead to a fall in production.

This recommendation was based on three main considerations. Firstly, in undertakings like plantations, industrial and agricultural work had to be closely integrated. Secondly, in certain specialised branches of agriculture such as horticulture, cattle-breeding, dairying, etc., investment has to be made on a long-term basis and several years elapse before the output could be realised. In the third place, it was thought that in safeguarding efficiently managed farms which consisted of compact blocks on which heavy investment or permanent structures had been made, risk of fall in production would be avoided.

29. In the legislation which has been enacted in the States, plantations have invariably been exempted from ceilings. There are provisions also in favour of specialised farms. There has been some measure of variation in the approach to sugarcane farms operated by sugar factories and to efficiently managed farms. Legislation in several States (Andhra Pradesh, Assam, Gujarat, Madhya Pradesh, Orissa, Punjab and Rajasthan) and proposals under consideration in some others (Bihar and Mysore) provide for the exemption of efficiently managed farms from ceilings. Where the exemption exists, by and large it has still to be implemented. In Kerala, Madras, Maharashtra and Uttar Pradesh, exemption of efficiently managed farms from ceilings has not been envisaged. In Uttar Pradesh, the Government has taken power to operate the surplus lands of mechanised farms as State farms and to appoint suitable persons as managers on terms and conditions to be prescribed, preference being given to the existing holders of these farms if they are otherwise qualified.

30. As regards sugarcane farms operated by sugar factories, legislation in several States exempts them from the operation of ceilings, as in Andhra Pradesh, Assam, Madhya Pradesh, Orissa, Rajasthan and PEPSU

area of Punjab and in the Bills at present under consideration in Bihar and Mysore. In three States, however, a different approach has been adopted. In Madras legislation provides for the setting up of a Sugar Factory Board to review whether individual factories should or should not be exempted from ceilings. Considerations such as the requirements of the sugar factory and its financial structure have to be taken into account before final decisions are taken. In Uttar Pradesh, while there is no exemption from ceilings, provisions relating to mechanised farms mentioned above would also apply to sugarcane farms operated by sugar factories. In Maharashtra, sugarcane farms of sugar factories are not exempted from ceilings but provision is made for maintaining the integrity of the farms in one or more compact blocks, for full and continued supply of raw material to sugar factories at a fair price, and for grant of surplus land to joint farming societies consisting, as far as possible, of persons who had previously leased their lands to the sugar factory, agricultural labourers employed on the farm, technical and other staff engaged by the factory for work on the farm, adjoining land holders who are small holders and landless workers.

31. The considerations urged in the Second Plan and the recommendations regarding the exemption from ceilings of efficiently managed farms and of sugarcane farms operated by sugar factories remain generally valid for the Third Plan and there are advantages in following the course proposed. On the other hand, where a State, because of practical difficulties or other considerations, wishes to adopt a different course, certain conditions should be assured. These are, firstly, that the integrity of the farms should be maintained and their levels of efficiency ensured and, secondly, in the case of sugar factory farms satisfactory and continuous supply of the raw material to the factory concerned should be secured.

Schemes of Resettlement

32. Proposals to set ceilings on agricultural holdings were intended to serve two objects—firstly, to bring about reduction in disparities and pave the way to the development of a progressive cooperative rural economy and, secondly, to provide land for redistribution to the landless sections of the rural population. Far-reaching legislation has been enacted and although precise estimates are difficult to make, it would appear that the total area of surplus lands likely to be available for distribution to the landless might be considerably less than what had been hoped for at one time. At the present stage in land reform the most important consideration is that such lands as can be made available by each State as a result of the implementation of its ceilings legislation should be allotted with least possible delay. Along with these lands, waste lands and, where possible, lands available through Bhoodan should be pooled

and systematic schemes of resettlement speedily implemented. In providing land care should be taken to make available the necessary credit and other facilities, so that those settled on the land may develop high standards of cultivation. It was contemplated in the Second Plan that in the settlement of land acquired in consequence of the application of ceilings, tenants displaced as a result of resumption of land for personal cultivation, farmers with uneconomic holdings and landless workers should receive preference. It was also proposed that settlements should be made, as far as possible, on cooperative lines. Generally, the legislation which has been enacted follows these recommendations. It was also proposed in the Second Plan that farmers with uneconomic holdings should be admitted into cooperatives constituted with surplus lands if they also agreed to pool their lands. In taking action along these lines the necessary financial and technical assistance should be provided as envisaged in the programme for the development of cooperative farming proposed for the Third Plan.

Consolidation of Holdings

33. Progress in the consolidation of holdings has been recorded in Punjab, Uttar Pradesh, Maharashtra, Gujarat and Madhya Pradesh. In other States, there has been comparatively little advance during the Second Plan. By the end of 1959-60 about 23 million acres had been consolidated and work was in hand over another 13 million acres. According to indications given by States, the total area likely to be taken up for consolidation in the Third Plan is about 30 million acres. With a view to making experience in consolidation of holdings available to all States, two special studies were prepared by the Planning Commission four years ago. One of these explained the methods which had been developed in different parts of the country and the problems which had been encountered. The second study set out suggestions for speedy execution of the programme of consolidation. Although consolidation of holdings has been regarded as an integral part of the agricultural production programme, in practice the two programmes are not always coordinated. Except where consolidation of holdings is already being undertaken on a large scale, in view of the limitations of trained personnel, it would appear desirable to concentrate consolidation work in areas which are already receiving irrigation or are likely to come under irrigation. The Planning Commission propose to study more closely how best the factors which come in the way of extension of the consolidation programme in the southern and eastern parts of the country can be overcome and what changes and adaptations in the present methods and system of consolidation are called for in these areas.

Land Management Legislation

34. The place to be assigned to land management legislation and the manner in which it should be applied need to be considered in the light of developments during the first two plans. In the First Plan, while land management legislation was intended to be general in scope, its specific applications were to be in relation to farms held by substantial owners. In the proposals in the Second Plan the object was that land management legislation should provide for standards of efficient cultivation and management which would permit objective and qualitative judgments. If farms could be classified into certain grades, those above the average could receive suitable encouragement, while those falling below the average could be assisted to come up to higher standards. For certain purposes the legislation could provide for sanctions. Legislation regarding land management has been enacted only in two States and in one Union Territory and even in these it has not been actually implemented. A large number of enactments exist in the States for certain specific agricultural purposes such as utilisation of waste lands, adoption of improved seeds, control of pests and diseases, etc. Much of this legislation is fairly old and needs to be reviewed in relation to the present development programmes for agriculture and the extension services which have been brought into existence in the community development blocks. While it will be of value to bring together the best experience in land management practices for the guidance of farmers, cooperatives and panchayats, the question of enforcing legislative sanctions and of the role of panchayats and panchayat samitis has to be studied further in consultation with the States and in the light of the experience gained by them in working the existing enactments.

Problems of Implementation

35. Problems arising in the implementation of land reform legislation enacted in the States have been studied by the Panel on Land Reform and the urgent tasks to be performed have been listed separately in respect of abolition of intermediaries, tenancy reforms and ceilings. The Panel has laid particular stress on the preparation of correct and up-to-date records of rights and on the need to strengthen the revenue administration. Records of rights have been brought up-to-date in several areas, but in some of them there is need for a more intensive programme of work. In several States, records of rights do not provide information regarding tenants, sub-tenants and crop-sharers, and as such implementation of the legislation itself suffers. Expenditure incurred on cadastral surveys and in the preparation and correction of records of rights has been included in the plans of some States and is eligible for Central assistance. Provisions made for these purposes would need to be augmented as the work proceeds.

36. A number of surveys of land reform have been undertaken in different parts of the country through the Research Programmes Committee of the Planning Commission. They bring out the problems encountered in enforcing the legislation. In view of the wide scope of the legislation which has been enacted and differences in conditions, it is desirable to extend these studies on a systematic basis. For this purpose the assistance of universities and leading research centres should be fully availed of. The aim should be to cover different areas in accordance with a general scheme and to arrange for the evaluation of land reforms both in the transitional phase and from the aspect of long-term economic and social effects.

37. The Planning Commission has under preparation a report on the progress of land reform which brings together the essential features of legislation enacted in different States. This study will also set out data regarding land holdings and cultivation collected at the census organised in 1954-55, which have been summarised in Annexure II of this Chapter.

ANNEXURE I

Ceiling on existing holdings—level of ceiling

State	level of ceiling		remarks
Andhra Pradesh:	4½ times the family holding i.e., 27 to 324 acres (a family holding varies from 6 acres of wet land bearing settlement taram No. 1 or settlement classification of 15 annas and above to 72 acres of dry land with taram above 5 and chalka soils with assessment below 8 annas).		Allowance made for size of family - additional one family holding for every member in excess of five. There is no outside limit.
Assam:	50 acres		No allowance for size of family.
Bihar: (Bill as reported upon by the Select Committee)	(*a*) land irrigated by flow irrigation work constructed and maintained by Government:	24 acres	Allowance made for size of family subject to an outside limit of twice the ceiling area.
	(*b*) land irrigated by lift irrigation work or tubewell constructed or maintained by Government:	36 acres	
	(*c*) land which is orchard and other lands not included in any other category:	48 acres	
	(*d*) diara land:	60 acres	
	(*e*) hilly, sandy and other lands not yielding paddy, rabi or cash crop:	72 acres	
Gujarat:	(*i*) dry crop land (including land irrigated from non-Government sources)	56 to 132 acres	No allowance for size of family
	(*ii*) rice land and seasonally irrigated land	38 to 88 acres	
	(*iii*) perennially irrigated land	19 to 44 acres	
	(The ceiling varies in different local areas as specified in the Act)		
Jammu and Kashmir:	22¾ acres		No allowance for size of family.
Kerala:	15 acres of double crop paddy land or equivalent area (equivalent areas vary between 15 to 37½ acres)		Allowance made for size of family subject to an outside limit of 25 acres of double crop paddy land or its equivalent area. For an unmarried adult person the ceiling limit would be half the ceiling area.

State	level of ceiling	remarks
Madhya Pradesh:	28 standard acres (a standard acre means one acre of perennially irrigated land, 2 acres of seasonally irrigated land and 3 acres of dry crop land). A Bill has been passed to reduce the limit to 25 standard acres and outside limit for a larger family to 50 standard acres.	Allowance made for size of family subject to an outside limit of 53 standard acres.
Madras: (Bill)	30 standard acres (standard acre varies depending on rate of assessment and class of land between 1 to 4 acres)	Allowance made for size of family—additional 5 standard acres for each member in exces of five subject to an outside limit of 60 standard acres.
Maharashtra:	(*i*) perennially irrigated land by flow irrigation: 18 acres (*ii*) seasonally irrigated lands by flow irrigation (*a*) irrigated for two seasons: 27 acres (*b*) irrigated for one season: 48 acres (*iii*) dry lands (including lands irrigated from non-Governmental sources): 66 to 126 acres in different local areas.	Allowance made for size of family subject to an outside limit of twice the ceiling area.
Mysore: (Bill as reported upon by the Select Committee)	27 standard acres (standard acre varies from one acre of wet land with assured irrigation on which two paddy crops can be raised to 8 acres of dry or garden land with less than 25 inches of annual rainfall).	Allowance made for size of family subject to outside limit of twice the ceiling area.
Orissa:	25 standard acres (standard acre varies from one acre of perennially irrigated land which is assured of water supply for at least three crops in a year to 4 acres of dry land).	Allowance made for size of family subject to an outside limit of twice the ceiling area.
Punjab: Punjab area:	30 standard acres not exceeding 60 ordinary acres. In case of displaced persons, 50 standard acres not exceeding 100 ordinary acres.	No allowance for size of family.
Pepsu area:	30 standard acres not exceeding 80 ordinary acres. In case of displaced persons, 40 standard acres not exceeding 100 ordinary acres. (Standard acre means an acre of land yielding between 10 and 11 maunds of wheat per acre matured).	No allowance for size of family.
Rajasthan:	30 standard acres (standard acre means land yielding 10 maunds of wheat or any other crop of equal value).	Allowance made for size of family subject to an outside limit of 60 standard acres.

State	level of ceiling	remarks
Uttar Pradesh: .	40 acres of fair quality land (an acre of fair quality land means an acre of land with hereditary rate of rent exceeding Rs.6; 1½ acres with rate between Rs.4 and Rs.6; and 2 acres with rate at Rs.4 per acre or less).	Allowance made at 8 acres of fair quality land for each member in excess of five subject to an outside limit of 64 such acres.
West Bengal: .	25 acres.	No allowance for size of family.
Delhi: . . .	30 standard acres (standard acre varies from 4/5th of an acre of irrigated land to 2 acres of Barani land).	Allowance made for size of family subject to an outside limit of 60 standard acres.
Himachal Pradesh: .	30 acres in district Chamba and land assessed to Rs. 125 in other districts.	No allowance made for size of family.
Manipur: . .	25 acres.	Allowance made for size of family subject to an outside limit of 5 acres.
Tripura: . .	25 standard acres (standard acre varies from one acre of nal or lunga land to 3 acres of tilla land).	Allowance made for size of family subject to an outside limit of 50 standard acres.

ANNEXURE II

Census of land holdings and cultivation

EXPLANATORY NOTE

As recommended in the First Plan, a census of land holdings and cultivation was carried out in 1954-55 in all States except Assam, West Bengal and Jammu and Kashmir and the Union Territories of Manipur and Tripura. In Assam and West Bengal, the State Governments had already collected certain data regarding land holdings. West Bengal had already enacted legislation for ceilings, in Assam a Bill had been passed and in Jammu & Kashmir a ceiling had been imposed earlier. A new census was not considered necessary in these States. In Manipur and Tripura the proposal to conduct the census was dropped due to lack of trained personnel and difficulties of terrain.

2. The census was based on complete enumeration of all holdings in the former States of Andhra, Bombay, Madhya Pradesh, Madras, Hyderabad, Madhya Bharat, Saurashtra, Ajmer, Bhopal and Kutch. In Punjab and in the former States of Mysore, Coorg, Delhi, Himachal Pradesh and Vindhya Pradesh, with a view to expediting the census, the enumeration was restricted to holdings of 10 acres and above. However, estimates of holdings below 10 acres were also made. In Bihar, Orissa, Rajasthan, Uttar Pradesh and in the former State of Travancore-Cochin sample surveys were undertaken.

3. The data relate generally to the year 1953-54. The main concepts employed in the census were the following:

(1) The census related to agricultural land comprised in owners' holdings, agricultural land being defined as the cultivable area, comprised in a holding, including groves and pastures. Unoccupied area such as forest land and other uncultivable land, was to be excluded. Land held in urban areas was also outside the scope of the census.

(2) The expression 'area owned' was defined so as to include lands held by owners as well as those held under occupancy (permanent and heritable) rights. Land owned by a person 'A' but held under rights of occupancy by a person 'B' was thus included in B's holding and excluded from 'A's holding. It was further agreed that persons who did not possess permanent and heritable rights de jure but enjoyed them for all practical purposes, should also be treated as owners.

(3) The entire agricultural land held by a person as owner throughout the State constituted a single holding. In the case of joint holdings, the share of each co-sharer was treated as a separate holding.

(4) Area under 'personal cultivation' was defined as the difference between 'area owned' and 'area leased'. The 'area leased' represents land let out to a tenant in which he has not acquired permanent and heritable rights.

4. To the extent they were available at the time, the results of the land census data were presented in summary form in the Second Five Year Plan. The data were subsequently retabulated for the States as reorganised in 1956. In this form they are set out in the tables which follow except for Bihar and Orissa. The Bihar Government felt that the data collected in the sample survey did not represent even approximately a correct picture of ownership and cultivation. The data received from Orissa were incomplete.

Distribution and size of holdings

(A) States where complete enumeration of holdings of all size groups was conducted

(in thousands)

		grades of holdings (in acres)									
		not exceeding 2·5	2·5—5·0	5—10	10—20	20—30	30—40	40—60	60—100	above 100	all grades
1. ANDHRA—(i) Former Andhra area											
a area owned	number of holdings	1253	514	423	272	87	39	31	17	9	2645
	percentage	(47·4)	(19·4)	(16·0)	(10·2)	(3·3)	(1·5)	(1·2)	(0·6)	(0·4)	(100)
	area	1417	1853	2976	3790	2115	1318	1491	1258	1816	18034
	percentage	(7·9)	(10·3)	(16·5)	(21·0)	(11·7)	(7·3)	(8·2)	(7·0)	(10·1)	(100)
b area under personal cultivation (1)	number of holdings	1188	486	396	253	80	35	27	14	7	2486
	percentage	(47·8)	(19·6)	(15·9)	(10·2)	(3·2)	(1·4)	(1·1)	(0·6)	(0·2)	(100)
	area	1303	1713	2739	3478	1900	1174	1295	1048	1151	15801
	percentage	(8·3)	(10·8)	(17·3)	(22·0)	(12·1)	(7·4)	(8·2)	(6·6)	(7·3)	(100)
c area leased	area	96	122	192	247	150	100	133	137	371	1548
	percentage	(6·2)	(7·9)	(12·4)	(15·9)	(9·7)	(6·5)	(8·6)	(8·9)	(23·9)	(100)
	percentage of area owned	6·7	6·6	6·5	6·5	7·1	7·6	8·9	10·8	20·5	8·6
(ii) Telengana area(2)											
a area owned	number of holdings	388	263	331	311	126	64	59	37	28	1607
	percentage	(24·2)	(16·4)	(20·6)	(19·4)	(7·8)	(4·0)	(3·6)	(2·3)	(1·7)	(100)
	area	447	968	2416	4413	3101	2196	2853	2863	5776	25033
	percentage	(1·8)	(3·9)	(9·6)	(17·6)	(12·4)	(8·8)	(11·4)	(11·4)	(23·1)	(100)

(1) Does not include cultivable land lying fallow for more than a year.

(2) Area in terms of 'dry acres'. Ordinary acres have been conveted into dry acres by equating one wet acre to 6 acres, on an average.

(A) States where complete enumeration of holdings of all size groups was conducted (in thousands)

		grades of holdings (in acres)									
		not exceeding 2·5	2·5—5·0	5—10	10—20	20—30	30—40	40—60	60—100	above 100	all grades
Telengana area—(contd.)											
b area under personal culivation	number of holdings	379	249	308	287	118	58	53	34	21	1507
	percentage	(25·1)	(16·5)	(20·5)	(19·0)	(7·8)	(3·9)	(3·5)	(2·2)	(1·5)	(100)
	area	441	945	2255	4086	2870	2013	2566	2535	3936	21647
	percentage	(2·0)	(4·4)	(10·4)	(18·8)	(13·3)	(9·3)	(11·9)	(11·7)	(18·2)	(100)
c area leased	area	32	81	203	397	277	219	302	319	1556	3386
	percentage	(0·9)	(2·4)	(6·0)	(11·8)	(8·1)	(6·4)	(9·0)	(9·4)	(46·0)	(100)
	percentage of area owned	7·2	8·4	8·4	9·0	8·9	9·9	10·6	11·2	26·9	13·5
2. GUJARAT AND MAHARASHTRA(1)											
a area owned	number of holdings	1928	1115	1286	1127	473	242	201	99	42	6513
	percentage	(29·6)	(17·1)	(19·7)	(17·3)	(7·3)	(3·7)	(3·1)	(1·5)	(0·7)	(100)
	area	2309	4129	9320	16097	11626	8368	9676	7355	8160	77040
	percentage	(3·0)	(5·3)	(12·1)	(20·9)	(15·1)	(10·9)	(12·6)	(9·5)	(10·6)	(100)
b area under personal cultivation (2)	number of holdings	1723	999	1137	1005	424	216	179	85	30	5798
	percentage	(29·7)	(17·2)	(19·6)	(17·3)	(7·3)	(3·8)	(3·1)	(1·5)	(0·5)	(100)
	area	1996	3662	8084	14139	10293	7411	8501	6201	5044	65330
	percentage	(3·1)	(5·6)	(12·4)	(21·6)	(15·8)	(11·3)	(13·0)	(9·5)	(7·7)	(100)
c area leased	area	360	658	1357	2114	1401	960	1123	1029	2516	11518
	percentage	(3·1)	(5·7)	(11·8)	(18·4)	(12·2)	(8·3)	(9·7)	(8·9)	(21·9)	(100)
	percentage of area owned	15·6	15·9	14·6	13·1	12·1	11·5	11·6	14·0	30·8	15·0

3. MADHYA PRADESH (3)

a area owned	number of holdings	4324			754	260	111	85	43	22	5599
	percentage	(77·2)			(13·5)	(4·6)	(2·0)	(1·5)	(0·8)	(0·4)	(100)
	area	14250			10587	6312	3827	4108	3232	4119	46435
	percentage	(30·7)			(22·8)	(13·6)	(8·2)	(8·8)	(7·0)	(8·9)	(100)
b area under personal cultivation (4)	number of holdings	1643	839	866	640	214	90	67	33	16	4408
	percentage	(37·3)	(19·0)	(19·6)	(14·5)	(4·9)	(2·0)	(1·5)	(0·8)	(0·4)	(100)
	area	1650	3047	6180	8932	5185	3072	3216	2461	2872	36615
	percentage	(4·5)	(8·3)	(16·9)	(24·4)	(14·2)	(8·4)	(8·8)	(6·7)	(7·8)	(100)
c area leased	area (4)	101	178	370	555	338	219	264	245	528	2798
	percentage	(3·6)	(6·4)	(13·2)	(19·7)	(12·1)	(7·9)	(9·4)	(8·8)	(18·9)	(100)
	percentage of area owned	—	—	—	5·2	5·4	5·7	6·4	7·5	12·8	—

4. MADRAS (5)

a area owned	number of holdings	1852	934	739	391	104	42	32	18	12	4124
	percentage	(44·9)	(22·6)	(17·9)	(9·5)	(2·5)	(1·1)	(0·8)	(0·4)	(0·3)	(100)
	area	2231	3360	5136	5389	2525	1424	1546	1357	2799	25768
	percentage	(8·7)	(13·0)	(19·9)	(21·0)	(9·8)	(5·5)	(6·0)	(5·3)	(10·8)	(100)
b area under personal cultivation (6)	number of holdings	1786	884	691	362	93	37	28	15	9	3905
	percentage	(45·7)	(22·6)	(17·7)	(9·3)	(2·4)	(0·9)	(0·8)	(0·4)	(0·2)	(100)
	area	2167	3170	4808	4962	2237	1315	1318	1113	1949	23038
	percentage	(9·4)	(13·8)	(20·8)	(21·5)	(9·7)	(5·7)	(5·8)	(4·8)	(8·5)	(100)
c area leased	area	114	175	286	362	200	138	188	208	817	2487
	percentage	(4·6)	(7·0)	(11·5)	(14·6)	(8·0)	(5·5)	(7·6)	(8·4)	(32·8)	(100)
	percentage of area owned	5·1	5·2	5·6	6·7	7·9	9·7	12·1	15·3	29·2	9·7

(1) Data for Gujarat and Maharashtra are not available separately. In Marathwada, area of holdings has been expressed in terms of 'dry acres.' One ordinary acre is, on an average, equal to 1.002 dry acres. Since the difference is small, in working out the distribution of holdings for the state as a whole, a dry acre has been equated to an ordinary acre.

(2) In Kutch area, the culturable waste lands held by owners have been included in 'area owned', but not in area under personal cultivation.

(3) Excludes Sironj sub-division transferred from former Rajasthan, as no census was conducted in this area.

(4) Excludes Vindhya Pradesh area.

(5) The data refer to Madras excluding the area transferred from the former state of Travancore-Cochin for which data are not available. Besides, area of holdings has been expressed in terms of 'dry acres'. One wet acre has been deemed to be equal to 'three dry acres'.

(6) Lands left waste due to the negligence of the owner and 'mamool' waste, though included in area owned, have been excluded from area under personal cultivation.

(B) States where the enumeration was restricted to 10 acres or more (in thousands)

		grades of holdings (in acres)							
		not exceeding 10	10—20	20—30	30—40	40—60	60-100	above 100	all grades
1. MYSORE									
a area owned	number of holdings	1790	430	160	74	59	30	14	2557
	percentage	(70·0)	(16·8)	(6·3)	(2·9)	(2·3)	(1·2)	(0·5)	(100)
	area	7004	6139	3914	2531	2840	2240	2780	27448
	percentage	(25·5)	(22·4)	(14·3)	(9·2)	(10·3)	(8·2)	(10·1)	(100)
b area under personal cultivation	number of holdings	—	373	133	61	47	22	17	653*
	area	—	3781	3266	2070	1493	1660	1589	13859*
c area leased	area	—	958	680	454	542	505	1061	4200*
	percentage of area owned	—	(15·6)	(17·4)	(17·9)	(19·1)	(22·5)	(38·2)	(20·5)*
2. PUNJAB									
a area owned	number of holdings	2505	284	96	42	32	17	8	2984
	percentage	(83·9)	(9·5)	(3·2)	(1·4)	(1·1)	(0·6)	(0·3)	(100)
	area	6963	4040	2329	1446	1564	1278	1638	19258
	percentage	(36·1)	(21·0)	(12·1)	(7·5)	(8·1)	(6·7)	(8·5)	(100)
b area under personal cultivation	number of holdings	—	233	76	32	23	10	4	378*
	area	—	3313	1831	1070	1076	732	620	8642*

c area leased	area	—	751	495	342	437	439	858	3322*
	percentage of area owned	—	(18·6)	(21·3)	(23·7)	(27·9)	(34·4)	(52·4)	(27·0)*
3. DELHI									
a area owned	number of holdings	87	4	1	(n)	(n)	(n)	(n)	92
	percentage	(94·6)	(4·1)	(0·9)	(0·2)	(0·1)	(0·1)	(n)	(100)
	area	152	51	19	8	5	3	3	241
	percentage	(62·9)	(21·2)	(7·9)	(3·5)	(2·0)	(1·2)	(1·3)	(100)
b area under personal cultivation	number of holdings	—	4	1	(n)	(n)	(n)	(n)	5*
	area	—	51	19	8	4	3	2	87*
c area leased	area	—	1	1	(n)	(n)	(n)	(n)	2*
	percentage of area owned	—	(1·6)	(2·5)	(3·5)	(5·0)	(5·0)	(10·1)	(2·6)*

Note:—(1) In Mysore and Coorg areas, holdings of 10 acres and above were enumerated, but n areas transferred from Bombay, Hyderabad and Madras, holdings of all size groups were enumerated.

(2) In Karnataka, area of holdings has been expressed in terms of 'dry acres'. One ordinary acre, on an average, is equal to 1·01 dry acres. Since the difference is small, in working out the distribution of holdings for the state as a whole, a dry acre has been equated to an ordinary acre.

*Relates to holdings of 10 acres and above.

(n) Means less then 500 or 0.05%.

(*) Relates to holdings of 10 acres and above.

(B) States where the enumeration was restricted to 10 acres or more

(in thousands)

		grades of holdings (in acres)							
		not exceeding 10	10—20	20—30	30—40	40—60	60-100	above 100	all grades
4. HIMACHAL PRADESH (1)									
a area owned	number of holdings	621	8	1	(n)	(n)	(n)	(n)	630
	percentage	(98·5)	(1·2)	(0·2)	(0·1)	(n)	(n)	(n)	(100)
	area	539	101	31	11	8	7	10	707
	percentage	(76·2)	(14·3)	(4·4)	(1·6)	(1·1)	(0·9)	(1·5)	(100)
b area under personal cultivation	number of holdings	—	7	1	1	(n)	(n)	(n)	9*
	area	—	97	30	10	7	6	10	160*
c area leased	area	—	4	1	1	1	(n)	(1)	8*
	percentage of area owned	—	(3·9)	(4·1)	(7·7)	(6·7)	(7·0)	(9·0)	(4·7)*

(1) In Chamba district, the census was carried out in Bhattiyat tehsil; in 58 random villages of Chamba tehsil and 36 random villages in Churah tehsil.

(n) Means less than 500 or 0·05%.

(*) Relates to holdings of 10 acres and above.

(C) States where enumeration of holdings was on sample basis

(in thousands)

		grades of holdings (in acres)									
		not exceeding 2·5	2·5—5·0	5—10	10—20	20—30	30—40	40—60	60—100	above 100	all grades
		1. KERALA—(i) Travacore-Cochin									
a area owned	number of holdings	1974	191	80	26	6	2	4			2283
	percentage	(86·5)	(8·4)	(3·5)	(1·1)	(0·3)	(0·1)	(0·1)			(100)
	area	1229	668	541	340	146	72	327			3323
	percentage	(37·0)	(20·1)	(16·3)	(10·2)	(4·4)	(2·2)	(9·8)			(100)
b area under personal cultivation	number of holdings	1958	176	67	20	4	1	2			2228
	percentage	(87·9)	(7·9)	(3·0)	(0·9)	(0·1)	(0·1)	(0·1)			(100)
	area	1346	621	456	262	86	42	144			2957
	percentage	(45·5)	(21·0)	(15·5)	(8·8)	(2·9)	(1·4)	(4·9)			(100)
c area leased	area	38	31	51	40	29	19	158			365
	percentage	(10·5)	(8·5)	(14·1)	(10·9)	(7·9)	(5·1)	(43·0)			(100)
	percentage of area owned	3·1	4·7	9·5	11·7	19·9	25·8	48·2			11·0
		(ii) Malabar (1)									
a area owned	number of holdings	374	130	103	73	20	9	8	5	3	725
	percentage	(51·5)	(18·0)	(14·2)	(10·0)	(2·8)	(1·3)	(1·1)	(0·6)	(0·5)	(100)
	area	416	480	740	1022	488	334	380	351	1043	5254
	percentage	(7·9)	(9·1)	(14·1)	(19·4)	(9·3)	(6·4)	(7·3)	(6·7)	(19·8)	(100)
b area under personal cultivation (2)	number of holdings	372	129	102	72	20	9	8	4	3	718
	percentage	(51·7)	(17·9)	(14·2)	(10·0)	(2·8)	(1·3)	(1·1)	(0·6)	(0·4)	(100)
	area	416	476	728	1010	477	262	368	334	847	4918
	percentage	(8·5)	(9·7)	(14·8)	(20·6)	(9·7)	(5·3)	(7·4)	(6·8)	(17·2)	(100)
c area leased	area	4	4	7	15	14	12	13	17	89	175
	percentage	(2·4)	(2·3)	(3·8)	(8·3)	(7·9)	(6·6)	(7·7)	(9·7)	(51·3)	(100)
	percentage of area owned	1·0	0·8	0·9	1·3	2·9	3·6	3·5	4·8	8·6	3·3

(In Travancore-Cochin the figures for 40—60, 60—100 and above 100 are bracketed together.)

(1) Census was based on complete enumeration of holdings of all size groups. Area has been expressed in terms of 'dry acres'.
(2) Lands left waste due to the negligence of the owner and 'mrmcol' waste, though included in area owned, have been excluded from area under personal cultivation.

(C) States where enumeration of holdings was on sample basis

(in ' thousands)

		grades of holdings (in acres)									
		not exceeding 2·5	2·5—5·0	5—10	10—20	20—30	30—40	40—60	60—100	above 100	all grades
(2) RAJASTHAN—(i) Former Rajasthan ([1])											
a area owned	number of holdings	53	31	34	26	9	4	3	2	1	163
	percentage	(32·2)	(19·2)	(21·0)	(15·8)	(5·6)	(2·7)	(2·0)	(1·0)	(0·5)	(100)
	area	58	114	244	361	220	147	157	126	136	1563
	percentage	(3·7)	(7·3)	(15·6)	(23·1)	(14·1)	(9·4)	(10·1)	(8·0)	(8·7)	(100)
b area under personal cultivation	number of holdings	48	29	32	23	8	3	3	1	(n)	147
	percentage	(32·5)	(20·0)	(21·5)	(15·6)	(5·3)	(2·3)	(1·8)	(0·8)	(0·2)	(100)
	area	55	108	228	324	189	116	122	83	59	1284
	percentage	(4·3)	(8·4)	(17·8)	(25·2)	(14·7)	(9·0)	(9·5)	(6·4)	(4·7)	(100)
c area leased	area	6	11	22	40	28	26	34	45	66	278
	percentage	(2·2)	(4·0)	(7·9)	(14·4)	(10·1)	(9·3)	(12·2)	(16·2)	(23·7)	(100)
	percentage of area owned	10·4	9·6	9·1	11·1	12·6	17·7	21·6	35·6	49·0	17·8
(ii) Ajmer area ([2])											
a area owned	number of holdings	57	21	18	10	3	1	1	(n)	(n)	111
	percentage	(51·6)	(19·1)	(16·3)	(9·2)	(2·3)	(0·8)	(0·5)	(0·2)	(n)	(100)
	area	56	76	128	143	63	30	24	13	18	551
	percentage	(10·2)	(13·7)	(23·2)	(26·0)	(11·5)	(5·4)	(4·4)	(2·4)	(3·2)	(100)
b area under personal cultivation	number of holdings	57	21	18	10	2	1	1	(n)	(n)	110
	percentage	(51·9)	(19·1)	(16·1)	(9·2)	(2·3)	(0·8)	(0·4)	(0·2)	(n)	(100)
	area	55	75	125	142	62	29	24	13	17	542
	percentage	(10·2)	(13·8)	(23·1)	(26·2)	(11·4)	(5·4)	(4·3)	(2·4)	(3·2)	(100)
c area leased	area	1	1	2	2	1	1	1	(n)	(n)	9
	percentage	(10·5)	(10·2)	(18·0)	(25·7)	(14·4)	(6·6)	(8·1)	(1·8)	(4·7)	(100)
	percentage of area owned	1·7	1·2	1·3	1·7	2·1	2·1	3·1	1·3	2·4	1·7

UTTAR PRADESH (³)

a area owned	number of holdings	33	8	4	2	(n)	(n)	(n)	(n)	(n)	48
	percentage	(68·6)	(16·8)	(9·7)	(3·7)	(0·7)	(0·2)	(0·2)	(n)	(0·1)	(100)
	area	29	29	32	24	8	4	3	2	3	134
	percentage	(22·0)	(21·4)	(24·0)	(17·8)	(6·0)	(2·7)	(2·3)	(1·7)	(2·1)	(100)
b area under personal cultivation	number of holdings	32	8	4	2	1	(n)	(n)	(n)	(n)	47
	percentage	(68·6)	(16·8)	(9·7)	(3·8)	(0·7)	(0·2)	(0·1)	(0·1)	(n)	(100)
	area	29	28	32	24	8	4	3	2	3	133
	percentage	(22·0)	(21·4)	(24·1)	(17·9)	(6·0)	(2·8)	(2·3)	(1·6)	(1·9)	(100)
c area leased	percentage	(25·7)	(18·4)	(15·0)	(5·5)	(5·8)	(0·9)	(3·4)	(13·6)	(11·7)	(100)
	percentage of area owned	(1·2)	(0·9)	(0·7)	(0·3)	(1·0)	(0·4)	(1·5)	(8·0)	(6·0)	(1·1)

(¹) Data relate to 22 selected tehsils.
(²) Data collected based on complete enumeration of holdings of all size groups.
(n) Means less than 500 or 0·05%.
(³) Data relate to 204 sample villages. No estimates were made for the state as a whole.

CHAPTER XV

LABOUR POLICY

LABOUR policy in India has been evolving in response to the specific needs of the situation in relation to industry and the working class and has to suit the requirements of a planned economy. A body of principles and practices has grown up as a product of joint consultation in which representatives of Government, the working class and employers have been participating at various levels. The legislation and other measures adopted by Government in this field represent the consensus of opinion of the parties vitally concerned and thus acquire the strength and character of a national policy, operating on a voluntary basis. Joint committees have been set up to assist in the formulation of policies as well as their implementation. At the apex of this tripartite machinery is the Indian Labour Conference.

RECENT DEVELOPMENTS

2. The structure of industrial relations has been designed for the purpose of securing peace in industry and a fair deal for the workers. When the efforts of the parties fail to secure an amicable settlement of industrial disputes, the Government has assumed powers of intervention. Provision has been made for conciliation of disputes and for enabling the State to refer unresolved differences to tribunals set up for the purpose. Stoppages of work after such a reference and any contravention of awards and agreements have been made illegal. This system has helped to check the growth of industrial unrest and has brought for the working class a measure of advance and a sense of security which could not otherwise have been achieved. At the same time, the spirit of litigation grew and delays attendant on legal processes gave rise to widespread dissatisfaction. In the course of the Second Five Year Plan a new approach was, therefore, introduced to counteract the unhealthy trends and give a more positive orientation to industrial relations, based on moral rather than legal sanctions. The stress now is on prevention of unrest by timely action at the appropriate stages and giving adequate attention to root causes. This involves a basic change in the attitudes and outlook of the parties and the new set of readjustments in their mutual relations.

3. A Code of Discipline in Industry, which applies both to the public and to the private sector, has been accepted voluntarily by all the Central organisations of employers and workers and has been in operation since the middle of 1958. The Code lays down specific obligations for the management and the workers with the object of promoting constructive cooperation between their representatives at all levels, avoiding stoppages

as well as litigation, securing settlement of disputes and grievances by mutual negotiations, conciliation and voluntary arbitration, facilitating the free growth of trade unions and eliminating all forms of coercion and violence in industrial relations.

4. The Code provides that a regular grievance procedure be laid down in all undertakings and complaints should receive prompt attention. The legal means of redress and the normal channels should be fully availed of and there should be no direct, arbitrary or unilateral action on either side. Under the Code, management and workers have agreed to avoid litigation, lock-outs, sit-down and stay-in strikes. There will be no recourse to intimidation, victimisation or 'go-slow.' The unions have also agreed not to engage in any form of physical duress and to discourage unfair practices such as negligence of duty, careless operation, damage to property, interference with or disturbance to normal work and insubordination. The employers have to allow full freedom to workers in the formation of trade unions and to abide by the criteria adopted for determining which union has a better claim to recognition. A union guilty of a breach of the Code of Discipline loses its right to such recognition. Both sides are pledged to the scrupulous and prompt implementation of awards, agreements, settlements and decisions. Organisations of employers as well as workers have bound themselves to express disapproval and take appropriate action against officers, office-bearers and workers who violate the letter or spirit of the Code.

5. It is obvious that a new concept with such far-reaching aims, in a difficult field, requires a considerable period of earnest endeavour before it gets firmly established in practice. The results so far achieved are, however, encouraging both in terms of the reduction of man-days lost owing to stoppages and in bringing about a general improvement in the climate of industrial relations. The number of man-days lost declined steadily and significantly from 47 lakh during January-June 1958, the six months prior to the introduction of the Code, to 19 lakh during July-December, 1960. The Code has also been successful in creating an awareness amongst the employers and workers of their obligations towards each other; the desire to settle disputes mutually without recourse to the wasteful methods of trial of strength and litigation is steadily growing.

6. The deplorable consequences of inter-union rivalry both for industry and for the workers are well-known. They have been mitigated to some extent by the Code of Conduct which was drawn up and accepted by the representatives of workers' organisations three years ago. The Code provides that every employee shall have the freedom and right to join a union of his choice. Ignorance and backwardness of workers shall

not be exploited by any organisation. Casteism, communalism and provincialism shall be eschewed by all unions, and there shall be no violence, coercion, intimidation or personal vilification in inter-union dealings. It is enjoined that there shall be unreserved acceptance of and respect for democratic functioning of trade unions and all Central organisations shall combat the formation and continuance of company unions.

7. The failure to implement awards and agreements has been a common complaint on both sides and if this were to continue, the Codes would be bereft of all meaning and purpose. A machinery for implementation and evaluation has, therefore, been set up at the Centre and in the States to ensure observance by the parties of the obligations arising from the Codes and from laws and agreements.

8. Two lines of advance during the period of the Second Plan deserve special mention because of their great significance as elements of labour policy and for the reason of the great promise they hold for the future. In the first place to give the workers a sense of belonging and to stimulate their interest in higher productivity, a form of workers' participation in management was evolved during the Second Plan. A small beginning was made in this direction on an experimental basis and Joint Management Councils have been set up so far in 23 units. The Council has the right to obtain information regarding the working of the undertaking and has direct administrative responsibility for matters concerning workers' welfare, training and allied matters. Its main function is to bring about mutual consultation between employers and workers over many important issues which affect industrial relations. In a seminar held in March, 1960, representatives of employers, workers, State Governments and others concerned reviewed their experience of the working of the Joint Councils and the solutions they had evolved for specific problems. Keeping in view the short duration of the experiment, its results have been found to be satisfactory and heartening. Secondly, after completion of the preparatory stage, the programme of workers' education has made a good start and is being widely appreciated. The scheme comprises the training of teacher-administrators and worker-teachers. The latter, on returning to their establishments on the completion of their training, start unit-level classes for the rank and file of the workers. According to an independent appraisal of the working of this scheme, these courses have helped to raise the self-confidence of the workers, increased their ability to take advantage of protective labour laws, reduced their dependence upon outsiders and inculcated in them an urge for material and economic welfare. A beginning was made in sponsoring investigations on labour problems through independent research institutions with Government support.

Approach and Outlook

9. The coming years should witness the fuller impact of the ideas which have been tried and found useful during the Second Plan period. The Third Five Year Plan has to make its own contribution towards the evolution of labour policy and the realisation of its basic aims. It has always to be kept in view that the measures that are adopted must serve adequately the immediate and long-term ends of planned economic development. Economic progress has to be rapid enough to attain a level of full employment, and secure a rising standard of living for the people. The fruits of progress should be shared in an equitable manner and the economic and social organisation which is being created must be in keeping with the concept of a socialist society. In the implementation of these objectives the working class has an important role and a great responsibility, and these will grow with the rising tempo of industrialisation. The large expansion of the public sector which is occurring and is being envisaged will make a qualitative difference in the tasks set for the labour movement and will facilitate the transformation of the social structure on the lines of the socialist pattern in view. The implications of this approach are manifold. Economic activity has not to be conceived of solely in terms of output and return; the principal test of this would be the good of all those who are engaged in it, the quality and growth of the individual human being and the service and happiness of the entire community. The surpluses that are generated are a social product, to which neither the employer nor the working class can lay an exclusive claim; their distribution has to be according to the worth of the contribution of each, subject to the requirements of further development and the interests of all the sections of society, in particular, the satisfaction of the basic needs of all its members. While jobs and functions may vary, all are workers of different grades. Those of the lowest rank and their children should be fortified in the faith that they are free to equip themselves to be able to rise to the highest positions and that the worker and management are joined in partnership to strive for common ends.Thus, a new type of community is being created in which individuals and groups are moved more by a sense of mutual obligations than the spirit of acquisitiveness or the making of private gains at the expense of the general well-being.

Industrial Relations

10. The development of industrial relations in the Third Five Year Plan rests on the foundations created by the working of the Code of Discipline which has stood the strain of the test during the last three years. A full awareness of the obligations under the Code of Discipline has to extend to all the constitutents of the Central organisations of

employers and workers, and it has to become more and more a living force in the day-to-day conduct of industrial relations. The sanctions on which the Code is based have to be reinforced, relying on the consent of the parties, for this purpose.

11. Ways will be found for increasing the application of the principle of voluntary arbitration in resolving differences between workers and employers. Steps will be taken to remove certain hindrances in the way of a fuller recourse to voluntary arbitration. The same protection should be extended to proceedings in this case, as is now applicable to compulsory adjudication. Government should take the initiative in drawing up panels of arbitrators on a regional and industry-wise basis. Employers should show much greater readiness to submit disputes to arbitration than they have done hitherto. This has to be the normal practice, in preference to a recourse to adjudication, as an important obligation accepted by the parties under the Code.

12. The law provides for the establishment of Works Committees at the plant level in order to develop harmonious relations between employers and workers. According to a recent assessment, the system has proved its capacity to render substantial help in composing differences between the parties though, owing to lack of earnest effort, the Committees are not functioning effectively in some units. The decision to demarcate the functions of Works Committees, as distinct from those of trade unions, will remove an obstacle in the way of the successful functioning of the Committees. It is, thus, essential that Works Committees are strengthened and made an active agency for the democratic administration of labour matters.

13. *Joint Management Councils.*—A major programme for the period of the Third Five Year Plan will be the progressive extension of the scheme of Joint Management Councils to new industries and units so that, in the course of a few years, it may become a normal feature of the industrial system. As it develops, workers' participation may become a highly significant step in the adaptation of the private sector to fit into the framework of a socialist order. It can serve to bridge the gulf between labour and management, create better mutual understanding and facilitate the adoption, on both sides, of an objective approach towards the problems of industry and the workers. The success or failure of an undertaking is not the concern of management alone. For the peaceful evolution of the economic system on a democratic basis, it is essential that workers' participation in management should be accepted as a fundamental principle and an urgent need. In course of time, management cadres should arise out of the working class itself. This will greatly help to promote social mobility which is an important ingredient of a socialist system.

14. Joint Management Councils should be set up in all establishments in the public as well as the private sector in which conditions favourable to the success of the scheme exist. A primary test of eligibility is the presence of goodwill on both the sides. Wherever a representative union exists, a Council should come into being as a matter of course. An intensive programme of workers' education will be undertaken in all the establishments where such Councils are set up.

15. *Workers' education.*—The programme of workers' education which Government has undertaken through a semi-autonomous Board is being run with the cooperation of all the employers' and workers' organisations. A large-scale expansion of this scheme is visualised for the period of the Third Plan. It is intended to diversify the programme and secure fuller association of workers' representatives and their organisations. The complementary question of management training in labour matters is also receiving consideration.

16. The spread of literacy among the workers is an indispensable precondition for the success of the various programmes that are being undertaken. The benefit of literacy should be made available to as large a number of workers as possible in the next few years, particularly to those below the age of forty.

17. *Trade unions.*—There is need for a considerable re-adaptation in the outlook, functions and practices of trade unions to suit the conditions which have arisen and are emerging. They have to be accepted as an essential part of the apparatus of industrial and economic administration of the country and should be prepared for the discharge of the responsibilities which attach to this position. Trade union leadership has to grow progressively out of the ranks of the workers, and this process will be greatly accelerated as the programme of workers' education gathers momentum. At present, the trade unions are in most cases labouring under the handicap of insufficient resources and are not in a position to obtain all the help and guidance that they need.

18. The basis for recognition of unions, adopted as a part of the Code of Discipline, will pave the way for the growth of a strong and healthy trade unionism in the country. A union can claim recognition, if it has a continuing membership of at least 15 per cent of the workers in the establishment over a period of six months and will be entitled to be recognised as a representative union for an industry or a local area, if it has membership of at least 25 per cent of workers. Where there are several unions in an industry or establishment, the union with the largest membership will be recognised. Once a union has been recognised, there should be no change in its position for a period of two years, if it has been adhering to the provisions of the Code of Discipline.

19. The personnel of the industrial relations machinery calls for greater attention in respect of selection as well as training. It is necessary to ensure that the quality and equipment of conciliators and tribunals are adequate for the complex tasks which now confront them. It is proposed to institute a suitable training programme for this purpose.

WAGES AND SOCIAL SECURITY

20. The Government has assumed responsibility for securing a minimum wage for certain sections of workers, in industry and agriculture, who are economically weak and stand in need of protection. Towards this end the Minimum Wages Act provides for the fixation and revision of wage rates in these occupations. These measures have not proved effective in many cases. For better implementation of the law, the machinery for inspection has to be strengthened. Wage determination in major industries is left to the process of collective bargaining, conciliation, arbitration and adjudication. The Second Plan recommended the setting up of Wage Boards as the most suitable method of settling wage disputes where large areas of industry are concerned. This has so far been applied to the cotton and jute textiles, cement, sugar and plantation industries; and will be extended to other industries according to circumstances. It has been decided to appoint a Board soon for the iron and steel industry. The representatives of employers and workers have agreed that unanimous recommendations of a wage board should be implemented fully. An encouraging trend has been noticed in the coal mining industry where employers and workers have agreed to set up a bi-partite committee to examine the entire question of wage revision in the industry; alternative wage-fixing machinery will be considered only if the bi-partite committee fails to arrive at a settlement.

21. Some broad principles of wage determination have been laid down in the Report of the Fair Wages Committee. On the basis of agreement between the parties, the Indian Labour Conference had indicated the content of the needbased minimum wage for guidance in the settlement of wage disputes. This has been reviewed and it has been agreed that the nutritional requirements of a working class family may be re-examined in the light of the most authoritative scientific data on the subject. Apart from the minimum wage, care should be taken in fixing fair wages for different classes of workers, that adequate incentives are provided for the acquisition and development of skills and for improvements in output and quality. There are, however, wide disparities between the wages of the working class, on the one hand, and the salaries at the higher management levels, on the other.

22. Owing to the uncertainty attaching to it, the question of bonus has become a source of friction and dispute. It has been decided to appoint a Commission which will include representatives of both parties to study the problems connected with bonus claims and to evolve guiding principles and norms for the payment of bonus.

23. *Social security.*—The Employees' State Insurance Scheme has now been implemented in more than a hundred centres covering about 17 lakh industrial workers. During the Third Plan period, the scheme will be extended to all centres where there is concentration of five hundred or more industrial workers, bringing the total coverage to about 30 lakh workers. Medical care and treatment including hospitalisation and midwifery services will be extended to the families of insured persons in all centres where the scheme is in operation. The preventive aspects will also receive greater attention. A great deal of leeway remains to be made up in the provision of separate hospital accommodation for the insured workers. The construction of new hospitals and dispensaries will be speeded up so as to add at least 6000 hospital beds during the period of the Third Plan.

24. The Employees' Provident Fund Scheme, which now covers 58 industries/establishments will be further extended. The employment limit for coverage under the scheme has already been lowered from 50 to 20. The Provident Fund Organisation has completed a survey of other industries and during the Third Plan the scheme will be extended to such industries among these as are able to bear the financial burden. The proposals to enhance the rate of contribution to the provident fund from $6\frac{1}{4}$ to $8\frac{1}{3}$ per cent has been already accepted by Government in principle, but in view of the varying capacity of different industries, a Technical Committee has been constituted to ascertain which industries are not capable of bearing the additional liability. It is also proposed to bring employees of commercial establishments within the purview of the scheme.

25. A Study Group on Social Security had recommended the integration of existing social security schemes and the conversion of the various Provident Fund schemes into a statutory scheme for old age, invalidity and survivorship pension-cum-gratuity. Urgent consideration has now to be given to the various aspects of the question of integration, so that the entire scheme takes shape as early as possible.

26. The social security approach has so far extended mainly to wage earners in organised industry. There are some groups whose condition calls for closer attention on the part of the community. In the past, on account of the traditional values associated with the small community and the joint family, a great deal of relief was available to those who

were unable to provide for themselves. For a long period to come, in one form or another, the community, the group and the family must continue to be the main sources of assistance. Progressively, however, the State and local bodies, both urban and rural, will need to participate in schemes undertaken by way of social assistance and social security. Even at this stage, it would be desirable to make a modest beginning in respect of three groups of persons—the physically handicapped, old persons unable to work, and women and children—where they are altogether lacking in the means of livelihood and support. Assistance for them will have to come from voluntary and charitable organisations, municipal bodies, Panchayat Samitis and panchayats and voluntary organisations. With a view to enabling these organisations to develop their activities with the help of local communities, and giving them a little support, it might be useful to constitute a small relief and assistance fund. Details of the proposal should be considered further in cooperation with States and voluntary organisations.

Working Conditions, Safety and Welfare

27. Under various laws, a comprehensive code has been developed to ensure satisfactory working conditions, safety of person and the provision of a variety of facilities to promote the welfare of the workers. Steps, however, have to be taken to make the implementation of the statutory provisions more effective. The improvement of working conditions can result in greater productive efficiency on the part of the workers. Every effort should be made to keep abreast of the modern developments in these and various other aspects relating to the human factor in industry. Towards this end, the activities of the Central Labour Institute and the three Regional Labour Institutes should be developed to provide a comprehensive service to industry through training, education and research. The problem of safety should receive greater attention. A Standing Advisory Committee will be set up to promote measures for bringing down the incidence of accidents in factories. State Governments have to strengthen the inspectorates provided for the administration of factory laws. Both in factories and in mines, a great deal of scope remains for reducing hazards by education of the workers in safety-consciousness and the setting up of safety committees. Steps are being taken in pursuance of the recommendations of the Mines Safety Conference and its various committees, and intensive studies are in progress concerning various aspects of the problem of safety in all mines. A National Mine Safety Council is proposed to be set up regarding safety education and propaganda in the mining industry. In view of the rapid expansion of the output of mines and the increase in depths and mechanisation to which it leads, it has become imperative that there should be greater vigilance and

stricter enforcement of rules and regulations. The building and construction industry is a similar field in which rapid programmes of expansion call for greater attention to safety standards. While the Central and State Public Works Departments are among the major employing authorities, a significant amount of building and construction work is in private hands. Working conditions at construction sites are very different from those in factories, primarily because of the purely "temporary" basis upon which most of the work is organised. The question of separate safety legislation for building and construction workers is under examination. Industrial hygiene surveys undertaken so far have disclosed that exposure to occupational disease has been increasing. The surveys should cover the remaining industries and prompt remedial action should be taken in each case. Special welfare funds have been constituted for financing welfare measures for workers in the coal and mica mining industries. They are meeting very real needs. Similar funds are proposed to be created for workers in the manganese and iron ore mines.

28. *Workers' cooperatives.*—Some progress has been made in the formation of miners' cooperative societies through the help of the Coal Mines Welfare Fund Organisation. A few workers' cooperative housing societies also exist in some industrial centres. On the whole, cooperation has not made much headway so far as the working class is concerned. It will derive immense benefit from the extension of cooperative activity in various forms. Campaigns should be undertaken for setting up cooperative credit societies and cooperative consumers stores. It is hoped that trade unions and voluntary organisations will evince greater interest and initiative in running such cooperatives.

29. *Industrial housing.*—Although the Subsidised Industrial Housing Scheme has been in operation for some years, the situation in respect of the housing of industrial workers has not improved and, in several centres, it has even deteriorated. The present approach to the problem has been found to be wholly inadequate and new ways will have to be devised immediately so that the workers may be assured of minimum standards in respect of living conditions within a reasonable period in the interest of their health and efficiency. Towards the same end, facilities for recreation and sports will have to be greatly enlarged for all sections of the workers.

30. *Other problems.*—With the help of studies which are now in progress regarding contract labour, it will be possible to select occupations in which contract labour will not be permitted and, where abolition is not feasible, to decide on the steps which can be taken to safeguard fully the interests of contract workers. While considerable improvement has occurred in the living and working conditions of employees in large and organised industries owing both to State activity and trade union action,

a great deal of leeway remains to be made up in respect of the workers engaged in agriculture and unorganised industries. Their conditions should become a matter of special concern to the Government as well as to the organisations of labour.

EMPLOYMENT AND TRAINING SCHEMES

31. A large increase in the demand for craftsmen will have to be met during the Third Plan. By the end of the Second Plan period, there were 166 industrial training institutes with 42,000 training seats. It is intended to increase the number of these institutes to a total of 318 by the end of the Third Plan with an additional 58,000 seats, raising the training capacity to 1 lakh craftsmen and an estimated out-turn of 2 lakh craftsmen during the Plan period. Adequate in-plant training facilities will also be provided. Separate facilities have been organised for the training of educated youth in the techniques of management so that such of them as have the inclination and aptitude for undertaking business responsibilities on their own or through cooperatives, will be provided with wider employment opportunities.

32. The capacity of the three existing Central Training Institutes for Craft Instructors will be raised from 512 to 976 seats and three other Central Institutes will be set up during the Third Plan period. As against 2000 in the Second Plan, 7800 instructors will be trained during the Third Plan. Separate arrangements are being made to train women craft instructors.

33. During the Second Plan, little progress has been registered under the apprenticeship training scheme, which has so far been carried out on a voluntary basis. It has now been decided to place the scheme on a compulsory footing and a Bill on the subject is proposed to be introduced in Parliament. A target of 14,000 seats has been set for the apprenticeship training programme. The target for the programme of evening classes for industrial workers is to raise the present 3000 seats to 15,000 seats during the Third Plan.

34. One hundred employment exchanges will be opened during the Third Plan with the object of providing at least one exchange in each district. It is also intended to increase the number of rural employment exchanges and strengthen the organisation of the State Employment Directorates. An effective start has been made with the Employment Market Information programme; the scheme now covers all public sector establishments and private sector units in 150 areas. The scheme will be extended to all areas covered by employment exchanges. Similar provision has been made for expanding the programme of Youth Employment Service, Youth Counselling and collection and analysis of occupational information undertaken by the exchanges.

35. Closures of establishments have occurred to a varying extent in certain industries during the last few years. Where unfavourable market conditions develop, marginal units are affected severely unless steps are taken in advance to safeguard their position. In several cases, the collapse follows a prolonged period of neglect and mismanagement. The workers, who are thrown out of employment, often fail to find avenues for absorption in other units in the same industry. It often happens that besides losing their jobs these workers are deprived of arrears of wages and even the collections in respect of Provident Fund or Employees' State Insurance cannot be recovered from the employers. As a result, the workers have to face acute distress.

36. It becomes evident that having regard to the human aspect, and for the purpose of preventing a sense of demoralisation among other workers, steps will have to be taken to afford a measure of relief and assistance to retrenched workers who are thus reduced to a state of helplessness. In a fully developed form such a scheme has to be on a contributory basis, with adequate support from the Government, and besides assistance and relief to the retrenched workers, its functions might include:

(1) help to industrial units which are temporarily in financial difficulties but have otherwise a reputation for efficiency and good management;

(2) taking over units for temporary management; and

(3) financing, in suitable cases, co-operative ventures of workers threatened by closures.

A start has, however, to be made immediately, and it has now been decided to draw up a scheme of a limited scope to furnish such assistance as is practicable in the existing circumstances. This will be in the form of loans to tide over the immediate difficulties and facilities for retraining for alternative occupations and for transfer to other places where work may be available. A small financial provision has been made in the Plan for this purpose.

PRODUCTIVITY

37. Industry is being called upon to meet, as rapidly as possible, the claims on behalf of the workers for a living wage, better living and working conditions, the needed volume of employment opportunities and a fuller measure of social security. It must yield a reasonable return on capital and provide for capital formation on an adequate scale. Neither the exercise of their organised strength in industrial conflicts, nor laws and the intervention of the State can help the workers much in realising their aspirations. Their gains can arise only out of the strength and dynamism of the economy, the only enduring basis of which is a rising level of productivity. No increase in profits which

does not come out of improvements in productivity but has its origin in current scarcity and the stresses of development, can be regarded as a sign of prosperity. Productivity has many facets and it suffers because of the one-sided and rigid approach which is frequently adopted in dealing with it both by the employers and the workers. Rationalisation of effort in every direction is the true basis of productivity. The term has often been wrongly associated with increase in workloads and added strain on workers in order to swell the volume of private gains. Large gains in productivity and an appreciable reduction in unit costs can be secured in many cases without causing any detriment to the health of the workers and without incurring any large outlays. Greater responsibility in this respect rests on the management which should provide the most efficient equipment, correct conditions and methods of work, adequate training and suitable psychological and material incentives for the workers. For several purposes, it will be more helpful to take the working group as a unit of activity rather than the individual worker, and the scheme of incentives should be aimed at the group no less than at the individual. The industry, trade unions and the Government should together ensure that every worker whether employed already or freshly recruited receives adequate training to acquire the requisite skill and efficiency. By proper organisation, it should be possible to supply the essential needs of the workers at reasonable cost without unduly increasing the burden on industry. Management has to give the lead by bringing about the maximum rationalisation in its own sphere and eliminating all unjustifiable practices which at present act as dis-incentives in drawing the best out of the workers. The vicious circle of poverty and unemployment and low productivity can be broken only by a tremendous stress on the maximum possible contribution being made by all the participants in the processes of production. For the workers no real advance in their standard of living is possible without a steady increase in productivity, because any increase in wages generally, beyond certain narrow limits, would otherwise be nullified by a rise in prices. Workers have, therefore, to insist on and not resist the progress of rationalisation in their own interest and in the larger interest of the country.

38. The pace of development as well as the volume of employment rests to a considerable extent on the capacity to export in the face of increasing competition. This can be achieved primarily through higher productivity and a measure of sacrifice by the employer, the worker and the rest of the community.

39. Vital reforms cannot be secured without the cooperation and goodwill of the workers. They can be brought about by creating a proper understanding and the provision of the necessary safeguards in the interests of the workers. The greatest anxiety experienced by the workers is with regard to the stability of employment. The agreement

regarding rationalisation at the national level guarantees to the workers security in their existing jobs. The scope for rationalisation can be considerably extended if effective arrangements are made for retraining and transfer to other jobs on the basis of the workers' consent. The workers can be expected to respond. A favourable environment for this should be created. This process will be helped greatly by the agreement reached at a seminar organised by the National Productivity Council, which provides an initial basis for cooperation for higher productivity. The formulation of the Code of Efficiency and Welfare will now be taken up for consideration by the Indian Labour Conference. Greater attention will also have to be given to the training of management at various levels in the important aspects of employer-employee relations. Systematic studies will have to be undertaken for determining the individual wage differentials and the manner in which wages should be linked to productivity. In this connection, the work of the Training-Within-Industry Centre in introducing T.W.I. and other techniques for improving the managerial and supervisory skills and that of the Productivity Centre in training in the higher productivity techniques and in carrying out field investigations like job evaluation and work load studies have helped in stimulating the interest of both management and workers. Further development in this field can be of considerable assistance in evolving rational wage policies.

RESEARCH

40. Government undertakes special programmes of studies and surveys of aspects such as working and living conditions, family budgets, wage census, index of earnings, patterns of absenteeism, productivity, etc. There will be further extension of this activity during the period of the Third Five Year Plan.

41. The inadequacy of reliable data on labour matters available at present and the need for sustained and objective research on a systematic basis were discussed at a Conference on Labour Research held in September, 1960. It was agreed that, to begin with, a small Central Committee for coordinating labour research, comprising representatives of Government, employers' and workers' organisations, universities and institutions interested in the subject may be constituted. It should be the function of this body to make a survey of the existing agencies in the field and their physical resources, identify the gaps, explore possibilities of filling up the same, determine priorities, allocate research schemes to the various agencies in order to avoid overlapping, stimulate research work in the labour field and recommend means of utilising the results of such research. It is intended to provide for research in labour matters some new institutional facilities outside the set-up of the Government. It will have the association and assistance of organisations of workers and employers as well as others.

CHAPTER XVI

ORGANISATION OF PUBLIC ENTERPRISES

THE Industrial Policy Resolution of April, 1956, recognising the need of rapid industrialisation for promoting the accelerated growth of the economy, emphasised the key role of the public sector in setting up new industrial undertakings in the following words:

> "The adoption of the socialist pattern of society as a national objective, as well as the need for planned and rapid development, required that all industries of basic and strategic importance, or in the nature of public utility services, should be in the public sector. Other industries which are essential and require investment on a scale which only the State, in present circumstances, could provide, have also to be in the public sector."

2. A number of basic industries which require large investments and extensive collaboration with foreign firms or governments and which could be undertaken only on the assurance of future prospects, with no immediate gain in sight, would not normally be started if reliance was to be placed entirely on private enterprise. As the need for establishing these industries is urgent and insistent in the present phase of the country's development, it is inevitable that the scope of the public sector should be large. Moreover, in the case of industries where for technological reasons, the plants have to be large, requiring big investments, by organising them in the public sector, undue concentration of economic and industrial power in private hands can be prevented.

3. Rapid expansion of the public sector would materially contribute to increasing public savings for investment, making it possible thereby to increase the rate of growth. The particular advantage of the expansion of the public sector from this point of view is that a possible conflict between efficiency and the distribution of income is, to a large extent, eliminated. Increased profits, which in the private sector would create inequalities (and possible conspicuous and wasteful consumption), in the public sector can be directly used for capital accumulation. By efficient conduct of enterprises and following a rational and economically sound price policy for its products and services, the public sector undertakings ought to secure adequate return on capital employed and contribute their full share to the increase in the portion of national resources devoted to investment.

4. As a direct consequence of the objective of working towards the realisation of a socialist pattern of society, there will be large expansion of the public sector in a wide range of activities, covering fields as varied as mining and manufacturing, generation and distribution of electric power, construction, transport and communications, irrigation, banking and insurance, trade, social services, etc. Extended operations in all these fields will call for the development of appropriate organisations and, as experience is gained in their working, it will be possible to make them progressively more efficient and effective. Although the discussion in this Chapter is primarily with reference to industrial undertakings, most of the considerations have applicability to a wider field.

5. During the last few years a number of major industrial undertakings have been established in the public sector. Several more are due to come in existence in the course of the Third Plan. Indeed, an increasingly large number of new enterprises will be established during each subsequent Plan period. So far, however, the main thought has been on initiating new projects and finding financial resources for them. It was getting things started which counted. The time has now come to give close attention to the question of how best to manage these enterprises so that they become efficient producers, capable of yielding substantial surpluses which will provide for future expansion, and set an example of careful planning, good management and cordial worker and management relationship.

6. As soon as a new project has been established, in fact much earlier, it is of utmost importance to give proper attention to its effective management. No matter how well the project has been conceived and the plant engineered, it will ultimately succeed or fail on the strength of its management. Before attempting an analysis of certain shortcomings of management and seeking to identify areas calling for remedial action, the present position regarding the organisation of public enterprises in the manufacturing field may be briefly described.

7. Public enterprises in the manufacturing field have been organised in three forms. Some of them like the Chittaranjan Locomotive Works are administered departmentally; there are a few which are corporations constituted by a statute; but the majority are joint stock companies established under the Companies Act, although sometimes designated as corporations. The important enterprises of the Centre have been listed in the Annexure which shows under each administrative Ministry, the name of the enterprise, the year of its establishment and its legal status.

8. The usual practice till recently was to establish each manufacturing unit as an independent company. Where it was felt that some special coordination was necessary between certain enterprises either because they were in the same field of operation or because they had special

commercial or technical relations with each other, it was sought to be achieved by having a number of common Directors. Moreover, in the case of enterprises under the same Ministry, there was little difficulty of coordination because even the Chairman of the Board and some of the Directors were the same on account of the fact that directorships in many cases were held by certain officials ex-officio.

9. It has now been recognised that proliferation of special organisations of such number and variety as to be unmanageable should be avoided and there should be a definite policy of consolidating these organisations so as to bring together enterprises functioning broadly in the same field. This would enable provision of common facilities to individual units, which otherwise might be well beyond their means, and lead to overall economy and efficiency. For example, a number of enterprises grouped together and working in the same field and pooling their resources can maintain an organisation of adequate size both for purchase and sale, with a net-work of branch offices on a large enough scale; can set up facilities for scientific and technological research; establish design and development organisation; undertake technical training programmes and institute suitable systems of personnel selection and recruitment on a common basis. Also as enterprises in the group will be largely concerned with the same type of problems, interchange of experience will be very profitable with a view to arriving at common solutions. Bringing together of several manufacturing units under the same company in this manner should not, however, lead to excessive centralisation on the part of the Board of Directors or intervention in the day-to-day activities of the individual constituent production units; otherwise, the General Manager of the undertaking will not have the necessary authority and initiative to ensure the smooth and efficient conduct of the enterprise.

10. The awareness of these possibilities is reflected in the recent tendency to form large companies such as the Hindustan Steel Limited, the Heavy Engineering Corporation, the Heavy Electricals Limited, the Hindustan Insecticides Limited, the Fertiliser Corporation, the National Coal Development Corporation, etc., each of which controls, or is intended to control, a number of separate undertakings in steel, machine building, chemicals, fertilisers, coal mining, etc.

11. Till some years ago, in the earlier stages, projects were handled departmentally. Later, a decision was taken that government enterprises of a commercial nature should be organised as companies. At present in the case of most of the new projects, such as the Heavy Machinery Project at Ranchi, a company is formed to see the project through from the very outset, including the stage of construction. Also existing companies are being encouraged to establish new units in their field as illustrated

by Hindustan Steel Limited being assigned the responsibility of establishing the Alloy and Tool Steels Plant at Durgapur and the new integrated steel works at Bokaro, and the Hindustan Machine Tools Company being charged with the responsibility of bringing into existence one or more machine tool factories.

12. It has become necessary now to give serious thought to the establishment of specialised agencies for designing and construction. These agencies would be able to undertake large works in connection with industrial development and to gain and preserve valuable experience of actual construction which could be put to use in the construction of similar succeeding projects. A start has been made with the establishment of design and construction organisations in Hindustan Steel Limited and Sindri Fertilisers Limited.

13. The successful operation of large industrial enterprises is a relatively new challenge. Efficient conduct of industrial and business enterprises requires that operational decisions should be prompt. They need not always be right for most such decisions are reversible and can be corrected later. Far greater delegation of authority and flexibility of operation is necessary to enable the management of the enterprise to produce results. If an enterprise does not have real autonomy it is not likely to be effective.

14. Lack of delegation within the enterprise is another common failure. Even as the general manager does not enjoy sufficient authority to manage effectively, there is often a failure by him and other management staff in the hierarchy to delegate authority to others down the line, who cannot do their jobs properly without the necessary authority. The lack of delegation of authority is usually accompanied by a failure to define responsibilities and duties. Nobody can operate confidently or effectively or be held responsible for results unless he knows what he is supposed to do and has the authority to do it.

15. Another important factor which determines the success of an enterprise is whether there are enough experienced men in positions of management. A good plant can appear to operate, and in fact can operate in an uneconomic way, without enough management staff, but if their number is not sufficient, an enterprise will be handicapped by high production cost, low output, high wastage, mechanical and processing difficulties and break-downs.

16. Lack of quality of managerial personnel is another factor prejudicing the success of an enterprise. Besides, there being too few experienced persons in managerial posts, often the key positions as general managers, production managers, maintenance superintendents, etc., are held by people who do not have the requisite training and experience to do their jobs effectively.

17. The consciousness of profit and cost is also not as widespread as is necessary. The purpose of management should be to secure economic efficiency; cost consciousness is necessary to achieve the desired results. But even the most cost-conscious manager cannot control costs unless he knows what they are, and this is not feasible without the use of cost accounting and other management techniques which are not being used very widely. There are deficiencies also in selection of personnel, their training, and in securing maximum work from them while giving them maximum satisfaction.

18. Some important aspects, calling for suitable action, are discussed below:

Public accountability.—Democratic control of publicly owned industries is very important. At the same time it is generally agreed that a public enterprise, if it is to be run successfully, must possess a sufficient degree of autonomy from Government and Parliament. When day-to-day decisions of a public enterprise become the subject of parliamentary interpellations and discussions, the Ministers will find it necessary to ask for advance knowledge and approval of all decisions. Moreover, exposed to constant public scrutiny, the management will be afraid of making the day-to-day decisions necessary in commercial undertakings, and an ostensibly autonomous enterprise will be virtually stifled by red tape and bureaucracy. The need has, therefore, been felt for a Committee of Parliament which would enable informed parliamentary criticism to be brought to bear on public enterprises. This Committee would keep itself continuously informed regarding the working of public enterprises. It may be useful if membership of the Committee is for a period of about three years so as to give time to members to master complex facts and to ensure some continuity. This will also result in a growing number of members of Parliament taking a specialised interest in these matters. As Parliament would be assured of necessary vigilance by the Committee, individual members would count on the judgment of the members of the Committee for proper and periodic evaluation of the public enterprises.

19. *Nature and functions of the Board of Directors*.—The main function of the Board should be to lay down the broad policies and the general objectives of the undertakings. Subject to the policies laid down, the Managing Director or the General Manager should have full authority and he should be held responsible for achieving the necessary results. Secretaries to the Ministries should not be appointed as Chairmen or Directors. It may, however, be useful, in the initial stages, to appoint one or two directors from amongst government officials who are actually dealing with the project in the administrative Ministry concerned and in the Finance Ministry. They will function like any other Director within the constitution of the Company and will be

bound by its rules and regulations. In respect of subjects reserved for the Government, they will be able to explain to the Board of Directors the thinking within the Government and, when matters are referred to Government, they will be able to explain the views of the Board of Directors.

20. The Managing Director and/or Chairman should be appointed by the Government and, except in the case of very small concerns, should be full-time. Other Directors may be full-time or part-time according to the requirements of the undertaking.

21. Membership of the Board should be on the basis of ability, experience and administrative competence, and should be open not only to the employees of the public undertakings but also to persons from outside. Having been selected to serve on the Board, all Directors must identify themselves with the interest of the undertaking.

22. The Board of Directors should have adequate powers to make appointments and to fix salaries. However, to avoid the risk of migration of personnel from one public sector undertaking to another if different scales of pay are adopted by them for posts of similar nature, it may be necessary to indicate to the Board broadly the basic scales of pay for different categories of posts. It should, however, be open to the Board to fix specific pays for specific jobs.

23. The powers of the Board for sanctioning of capital works will have to be considerably enhanced as the limits stipulated in the case of some of the big undertakings appear to be too low at present. The financial limits will have to be comparatively high in the case of big undertakings and could be more modest in the case of smaller undertakings. The reference to the Government for expenditure sanction should be reduced to the minimum so that within the frame-work of certain rules and limits, the Board of Directors should be free to proceed with the operations of the plant or the execution of a project.

24. Of late, there has been an attempt to form large companies under which are brought together separate undertakings of allied character. The constitution of such large companies has been considered desirable from the point of view of providing certain common facilities to individual units in the interest of overall economy and efficiency. The wider delegation of power from the Ministry to the Company should be accompanied by sufficient delegation of authority by the Company to the General Managers of the individual undertakings. The defects of excessive centralisation would remain and the operation of individual undertakings would be adversely affected if the requisite authority and autonomy are withheld from the men on the spot who have to run the undertaking.

25. *Managing Director/General Manager.*—The leadership, guidance and the main driving force must come from the Managing Director/ General Manager. He must be selected on the basis of technical competence, administrative ability and quality of leadership. He must be able to see clearly what is going on and to know which department is not working satisfactorily and must have the requisite knowledge and authority to help the departmental managers to put it right. He must enjoy real autonomy within the frame work of general rules laid down and must be held responsible for the results. Day-to-day decisions should be his concern. It must be recognised that some mistakes will occur, for these are inevitable when decisions have to be taken quickly in the interest of efficiency. The flexibility of operations will be possible only if he enjoys a reasonable degree of freedom from being called upon to explain to a number of different people at different times why certain decisions were taken and why departures had to be made from particular rules. For the proper discharge of his responsibilities, the General Manager should remain in charge of an undertaking for a reasonably long period so that he has an intimate knowledge of the problems and possibilities of his enterprise. Quick changes of appointments must, therefore, be avoided. At the same time, his security of tenure should depend on performance. If he succeeds, he will naturally be continued in office and receive encouragement; if he fails he must expect to be superseded.

26. *The role of Financial Adviser.*—All companies should be provided with an internal Financial Adviser who should function subject to the authority of the General Manager. In case of difference of opinion, it should be quite open to the General Manager to overrule the advice of the Financial Adviser, but there should be a convention that such cases should be brought to the notice of the Board by the General Manager at the next Board meeting.

27. The Financial Adviser should concern himself with problems of financial management rather than devote exclusive attention to those of control of expenditure. For this purpose it would be necessary to arrange for orientation of Financial Advisers in the principles and practices of financial management either before joining an undertaking or through refresher courses. This is required particularly for Financial Advisers who may be drawn from the usual channels available for this purpose at present.

28. *Supporting management.*—The General Manager should have enough supporting management staff to provide adequate control, supervision, direction and training for all employees. This staff should be selected and appointed by the General Manager, subject to Board approval, and should be responsible only to him or to some one authorised

by him. He should delegate and define adequate authority to them and then hold them responsible for performance.

29. *Building up of management cadres.*—The efficient functioning of the enterprises will depend greatly on two important factors bearing on personnel management, namely training for positions of responsibility in the organisation and development of personnel to serve as second line for eventual selection to key appointments. Managerial personnel for key appointments should not only be technically qualified but they should also develop an "all plant" outlook. The manner in which this should be done will depend on the particular circumstances of each enterprise, which may use specially devised courses and other practical ways such as giving opportunities to selected persons for proving their managerial capacity in suitable posts.

30. *Advance planning.*—Planning, that is deciding in advance what is to be done, is a precondition for the success of an enterprise. It provides the basis for organisation, assembling resources, direction and control. An able manager is one who can say with an assurance based on detailed planning what products he would produce during the next month and the year, how many men and of what qualifications he would need and what would be the expense thereof, which materials and in what quantities would be required, what the spoilage would be and can state in similar specific terms the results he plans to achieve in other phases of his operation.

31. The plans for a given enterprise should fall into a hierarchy. A general objective is accompanied by a whole series of successively more detailed plans, each designed to implement the general plan of which it is a part. There have to be similarly general plans for longer periods, say five years, annual operational plans and budgets and detailed day-to-day programmes of individual departments.

32. The preparation of advance costs, operation and capital budgets will greatly reduce the need for making references to the administrative Ministry and strengthen the autonomy and flexibility of the enterprises. All enterprises, in their own interest, should, therefore, build suitable machinery for this purpose.

33. Advance planning provides an opportunity for seeing that each part fits in with the other and is directed towards the overall purpose. When bottlenecks or weak spots are uncovered by careful and realistic advance planning, there is often time to find a remedy before the event occurs, whereas expensive breakdowns may be unavoidable if corrective action is not initiated until overwhelmed by a crisis. Moreover, trouble is often more easily corrected in its early stages than after a crisis has developed. Thus, for example, preventive maintenance systematically

carried out avoids expensive repairs and replacements and shutting down of plants later. The existence of a detailed plan provides the impetus for developing more efficient methods and procedures and also facilitates delegation of authority.

34. Setting up of specific goals and subgoals is an inseparable part of the whole planning process. A wide variety of operating standards and 'norms' need to be set up to express the anticipated results of the more detailed plan. These may include norms for use of raw materials; power and fuel; inputs of labour; overhead expenses; targets of output, both in terms of quantity and quality; tasks for training, etc. Comparable data from other similar plants in the country and outside are often found of value in this connection. An operational budget of the enterprise, carefully prepared from this point of view, could serve as the goal towards which all activities are directed. Many benefits follow from such practice. It makes purposeful and integrated planning easier; it helps the executive and the operators to concentrate on the essentials and contribute to the constant vigilance that is necessary to keep the enterprise from unproductive activities; the accumulation of operational data and norms useful for planning provides the basis for building realistic programmes in future; and. most important of all, the setting up of specific goals and norms is an essential condition for administrative control, that is, the securing of results in accordance with plans. Standards and norms are vital if appraisal is to have any validity. Also the recognition and acceptance of specific and clearly defined objectives and standards play an important part in the motivation of individual effort.

35. *Incentives.*—An enterprise which has worked realistic 'norms' of performance would find it easy to introduce systems of wage incentives, which play an important part in raising labour productivity, reducing costs and improving quality. These systems fall into three broad categories: (1) wages regulated on piece work, (2) a basic wage for an agreed output to which is added a bonus proportionate to additional output, and (3) a bonus payable on the output of a group, each member of which draws a separate basic wage. The applicability of any system depends to a large extent on the specific situation of an enterprise and has to be worked out in relation to its requirements. All that can be said is that incentive wage system should be introduced on the largest possible scale for the mutual benefit of the workers and the industry.

36. *Research departments.*—It is necessary to maintain adequately staffed Research and Development Departments in the public undertakings which should constantly endeavour to improve the product quality and operational and technical efficiency through scientific studies. The recommendations of such departments should be implemented speedily. Innovations and new ideas should be suitably rewarded and publicised.

There should be frequent exchange of technical and managerial experience between different public enterprises so that all benefit from the common pool of experience. Inter-plant visits will be useful in this connection.

37. *Personnel relations.*—The enterprises of the public sector have a special obligation to follow labour policies which are conducive to securing and keeping a competent working force at a reasonable cost. This requires a suitable wage policy with incentives, careful selection of personnel, organised training to improve the skills of workers at all levels, opportunities for workers to attain higher positions as their ability improves, active encouragement of workers to make suggestions to improve the operations of the enterprise and recognition of useful ideas by suitable rewards, a grievance procedure to settle small problems before they become large, and generally an attitude towards the workers which will encourage added effort and initiative and give the employees satisfaction, a sense of participation and feeling of loyalty to the enterprise and pride for its achievement.

38. *Surpluses and their utilisation.*—When public enterprises run efficiently and follow a proper price policy for their goods and services, the results of their operations must be reflected in larger earnings and surpluses. In a developing economy, these constitute a ready and increasingly important source for financing investment either for the expansion of the enterprises which yield these surpluses or elsewhere in the economy. It is, therefore, incumbent on public enterprises to produce efficiently and to accumulate surpluses which should be earmarked for further development.

39. It is not enough for an enterprise to operate efficiently and carry out its assigned task satisfactorily. It must assume responsibility for continuously improving its performance and for initiating and planning its growth and expansion. The management of a public enterprise should not merely carry out plans approved by Government, but must in fact be closely concerned with and be largely responsible for preparing the plans for further development and for securing the requisite resources.

40. A brief review like the one attempted here must of necessity leave many gaps. It is not the purpose to prescribe detailed operational recommendations for each enterprise but to touch upon some significant aspects to which greater attention needs to be given. Many of the enterprises in the public sector have already adopted policies and management techniques which have enabled them to produce remarkable results in relatively short time. The record of public enterprises, considering their relatively recent origin, is very creditable. The deficiencies of management to which attention has been drawn are as characteristic of enterprises in the private sector as in the public sector. Striving for constant improvement must be a common goal for all.

carried out avoids expensive repairs and replacements and shutting down of plants later. The existence of a detailed plan provides the impetus for developing more efficient methods and procedures and also facilitates delegation of authority.

34. Setting up of specific goals and subgoals is an inseparable part of the whole planning process. A wide variety of operating standards and 'norms' need to be set up to express the anticipated results of the more detailed plan. These may include norms for use of raw materials; power and fuel; inputs of labour; overhead expenses; targets of output, both in terms of quantity and quality; tasks for training, etc. Comparable data from other similar plants in the country and outside are often found of value in this connection. An operational budget of the enterprise, carefully prepared from this point of view, could serve as the goal towards which all activities are directed. Many benefits follow from such practice. It makes purposeful and integrated planning easier: it helps the executive and the operators to concentrate on the essentials and contribute to the constant vigilance that is necessary to keep the enterprise from unproductive activities; the accumulation of operational data and norms useful for planning provides the basis for building realistic programmes in future; and, most important of all, the setting up of specific goals and norms is an essential condition for administrative control, that is, the securing of results in accordance with plans. Standards and norms are vital if appraisal is to have any validity. Also the recognition and acceptance of specific and clearly defined objectives and standards play an important part in the motivation of individual éffort.

35. *Incentives.*—An enterprise which has worked realistic 'norms' of performance would find it easy to introduce systems of wage incentives, which play an important part in raising labour productivity, reducing costs and improving quality. These systems fall into three broad categories: (1) wages regulated on piece work, (2) a basic wage for an agreed output to which is added a bonus proportionate to additional output, and (3) a bonus payable on the output of a group, each member of which draws a separate basic wage. The applicability of any system depends to a large extent on the specific situation of an enterprise and has to be worked out in relation to its requirements. All that can be said is that incentive wage system should be introduced on the largest possible scale for the mutual benefit of the workers and the industry.

36. *Research departments.*—It is necessary to maintain adequately staffed Research and Development Departments in the public undertakings which should constantly endeavour to improve the product quality and operational and technical efficiency through scientific studies. The recommendations of such departments should be implemented speedily. Innovations and new ideas should be suitably rewarded and publicised.

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ANNEXURE

List of major public enterprises of the Centre in the field of manufacturing and mining

[With authorised capital of Rs. 5 million and above]

Ministry/Enterprise	year of establishment
Commerce and Industry	
1 Indian Drugs and Pharmaceuticals Ltd.	1961
2 Heavy Electricals Ltd.	1956
3 Heavy Engineering Corporation Ltd.	1958
4 Hindustan Antibiotics Ltd.	1954
5 Hindustan Cables Ltd.	1952
6 Hindustan Insecticides Ltd.	1954
7 Hindustan Machine Tools Ltd.	1953
8 Hindustan Organic Chemicals Ltd.	1960
9 Hindustan Salt Company Ltd.	1958
10 Nahan Foundry Ltd.	1952
11 Hindustan Chemicals and Fertilisers Ltd.	1956
12 National Instruments Ltd.	1957
13 National Newsprint and Paper Mills Ltd.	1947
14 Sindri Fertilisers and Chemicals Ltd.	1951
15 Praga Tools Corporation Ltd.	1943
16 Hindustan Photo Films Manufacturing Company Ltd.	1960
Defence	
17 Bharat Electronics Ltd.	1954
18 Prototype Machine Tool Factory*	1953
19 Hindustan Aircraft Ltd.	1940
Department of Atomic Energy	
20 Indian Rare Earths Ltd.	1950
Finance	
21 Silver Refinery, Calcutta*	1952
Railways	
22 Chittaranjan Locomotive Works*	1948
23 Integral Coach Factory*	1952

Ministry/Enterprise	year of establishment
Steel, Mines and Fuel	
24 Hindustan Steel Ltd.	1953
25 Indian Refineries Ltd.	1958
26 National Coal Development Corporation Ltd.	1956
27 National Mineral Development Corporation Ltd.	1958
28 Neiveli Lignite Corporation Ltd.	1956
29 Singareni Collieries Company Ltd.	1920
30 Oil and Natural Gas Commission**	1956
Transport and Communications	
31 Indian Telephone Industries Ltd.	1948
32 Hindustan Shipyard Ltd.	1952
33 Hindustan Teleprinters Ltd.	1960
Works, Housing and Supply	
34 Hindustan Housing Factory Ltd.	1953

*Departmental undertaking. ** Statutory corporation.

All others are companies registered under the Companies Act.

CHAPTER XVII

ADMINISTRATION AND PLAN IMPLEMENTATION

I

Administrative Tasks

The Third Five Year Plan envisages a scale of national effort far exceeding that of the preceding decade. A statement of its objectives and targets can scarcely convey the scope and range of the tasks which the nation has undertaken to fulfil during the next five years. In the last analysis the Plan rests on the belief that the requisite effort will be forthcoming and that, at each level in the national life, within the limits of human endeavour, an attempt will be made to implement it with the utmost efficiency. Of the many assumptions on which a Five Year Plan is based, this is not only the most important but also the most difficult. The economic goals of the Plan are vital in themselves and are at the same time a foundation for future growth; yet, they are but one aspect of the challenge implicit in the Plan. There is, for instance, the expectation that, given reasonable conditions, it will be possible to mobilise savings for implementing the entire physical programme accepted for the Third Plan period and more. Against the background of a rate of growth of population of well over two per cent per annum, to expect to provide work at least to the entire addition to the labour force implies not only efficient implementation of all programmes but also intensive and nation-wide use of the available manpower resources. The realisation of the principal social objectives of the Plan, especially equal opportunity for all citizens, the provision of basic necessities, reduction in disparities of income and wealth and the more even distribution of economic power depends on the execution of a wide range of policies and programmes.

2. The Plan has to be implemented at many levels—national, State, district, block and village. At each level, in relation to the tasks assigned, there has to be cooperation between different agencies and an understanding of the purposes of the Plan and the means through which they are to be secured. In a vast and varied structure organised on a federal basis, a great deal depends on being able to communicate effectively between different levels, and at the same level between different agencies. In many vital sectors of the Plan, responsibility for execution lies with authorities in charge of large projects. The role of such projects grows as the economy develops and in consequence many

new problems of organisation have to be solved. In a developing economy the functioning, side by side, of an expanding public sector and a private sector, which is in part organised and in large part unorganised, also raises difficult administrative problems.

3. The past decade has been a period of considerable change and adaptation in the field of administration. Innovations have been introduced and new institutions established, although perhaps many of them have yet to be fully integrated with one another and with the structure as a whole. With increase in the range of Government's responsibilities and in the tempo of development, the volume and complexity of administrative work have also grown. The administrative machinery has been strained and, at many points in the structure, the available personnel are not adequate in quality and numbers. The administrative burden of carrying out plans of development, large as it is at present, will increase manifold under the Third Five Year Plan, and doubtless new problems in public relations will also come up. In the recent past, certain aspects of administration have attracted pointed attention. These include the slow pace of execution in many fields, problems involved in the planning, construction and operation of large projects, especially increase in costs and non-adherence to time-schedules, difficulties in training men on a large enough scale and securing personnel with the requisite calibre and experience, achieving coordination in detail in related sectors of the economy and, above all, enlisting widespread support and cooperation from the community as a whole. In the larger setting of the Third Plan, these problems are accentuated and gain greater urgency. It is widely realised that the benefits that may accrue from the Third Plan will depend, in particular in its early stages, upon the manner in which these problems are resolved. As large burdens are thrown on the administrative structure, it grows in size; as its size increases, it becomes slower in its functioning. Delays occur and affect operations at every stage and the expected outputs are further deferred. New tasks become difficult to accomplish if the management of those in hand is open to just criticism. In these circumstances, there is need for far-reaching changes in procedures and approach and for re-examination of prevalent methods and attitudes.

II

Efficiency and Standards in Administration

4. Each area of development administration has its own specific problems. There are, however, some common directions of reform which are applicable to all branches of administration and deserve emphasis in view of the experience gained in the Second Plan. The primary aim must be to ensure high standards of integrity, efficiency and speed

in implementation. The process of improving administrative efficiency is a continuous one and progressively, through work studies, and improved systems of office administration and in other ways, better methods have to be devised. Already, both at the Centre and in the States, greater attention is being given to organisation and methods, to increasing incentives, and to the evaluation of performance. To an extent speed in implementation and efficiency in individual processes are interrelated. In the context of development, however, the former presents perhaps the more difficult issues in organisation, especially where the structure becomes large and complex and responsibility is widely shared. There are some common features in the way in which this problem arises at the national and at the State level, but, on account of differences in the relative size of the operations undertaken, there are distinct differences in degree. From such study and thought as has been given to this subject, some of the main directions in which action should be taken to speed up implementation are described below. It is recognised, of course, that while changes in organisation and procedure can go some distance to remove causes of delay and to achieve greater speed, they have to be supported by greater attention to the training of personnel, to supervision and to reporting and evaluation. Nevertheless, without a concerted attempt to make the administration much more action-oriented than at present, these measures may not yield enough results.

5. For the execution of any programme or project, the primary need is to fix specific responsibility on the agency concerned and, within it, on particular individuals. Within defined limits, each individual should be given full responsibility and, with it, the necessary measure of support and trust. If he fails in the discharge of his responsibility, he should be replaced. But so long as he holds the office with which he is entrusted, he should accept all its obligations, and, equally, he should be placed in a position effectively to discharge them. With responsibility thus specified, it should be open to him to seek such advice and consultation as he may require, but these should not become the necessary ingredients of the executive process itself. In the present functioning of the administration, consultation with other authorities is not always confined to broader matters; instead, it is too frequent and too concerned with details and, therefore, impedes effective action. Exercise of financial control is one important aspect of this problem. Obviously, the question here is one of ensuring wide delegation of financial powers to the heads of administrative Departments, with Finance Department undertaking their principal scrutiny prior to the framing of the annual budget.

6. As was pointed out both in the First and in the Second Plan, Central Ministries and perhaps Secretariat Departments in the States have tended to assume responsibility for an increasing amount of original work. This

has reduced the initiative of the executive Departments and their ability to function on their own. The main preoccupation of Ministries and Secretariat Departments should be with matters of policy, general supervision and enforcement of standards, and executive tasks should be left to be carried out by Departments and authorities specially designated for the purpose.

7. A necessary condition of placing specific responsibility and providing the means for fulfilling it is that success or failure should be judged by the test of results. This is possible only if in the planning stage care is taken to specify the tasks to be undertaken, the means to be employed, the obligations of the various agencies or individuals concerned, and the time sequence in which different operations must flow and dovetail into one another. These conditions apply to several branches of administration and, more especially, to large projects.

8. By its very nature, a plan of development necessarily involves the setting of targets and subsequent appraisal of fulfilment. Targets may provide useful indicators of progress, and may make for concentrated effort, but equally important are the specific measures and policies needed to realise them and their sustained implementation. There are fields in which targets in the sense of final figures of output or capacity are on the whole better avoided, either because of faulty methods of estimation or because the concepts are defective. However, where a target is meaningful, it should be worked out by the agency responsible for it after careful study and should be further broken down into smaller units in terms of time-schedules and responsibility for execution. Five year targets should also be reassessed each year in the light of experience, and a further view taken regarding the likely future trends.

9. Attention has been sometimes drawn to the fact that in the present system of administration, incentives are not given an adequate role. It is obvious that incentives, whether for individuals or for groups, help to build morale. A pre-requisite for a scheme of incentives is the ability to work out performance standards in an effective manner. The directions in which, within any specific area, an incentive scheme is likely to prove beneficial would need to be studied. For instance, in industrial undertakings, in the present circumstances, incentive schemes might assist greatly if they were directed to objects such as the following:

(a) reduction in construction costs,

(b) reduction in foreign exchange,

(c) improvement in methods of maintenance,

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(c) improvement in methods of maintenance,

(d) use of substitutes and by-products, and

(e) simplification of work procedures.

Material incentives are of course important; with these there should also be increasing scope for the development of non-material incentives, especially various forms of appreciation and recognition of worth, a sense of partnership in a common endeavour, and human relationships based on mutual respect and friendliness.

III

Projects in the Public Sector

10. The public sector already includes an extensive range of enterprises such as industrial undertakings, irrigation and power projects, railways, road transport, air transport, shipping and others. Some of the main problems of organisation of industrial enterprises have been reviewed in the preceding Chapter. Experience gained during the Second Plan has suggested certain lines of action which should help increase the speed and efficiency of implementation of projects and secure greater economies in their construction and operation.

11. Large projects take considerable time to yield results, and their planning requires careful preparation. They have to be conceived in terms longer than the usual Plan periods. They must, therefore, form part of a scheme of development stretching over a longer period, say, 10 to 15 years. In the course of the preparation of the Third Plan, although to a smaller extent than in the Second, it was observed that many of the projects proposed for inclusion were not worked out fully, nor were they presented adequately. For a considerable number of projects included in the Third Plan, the information available even at this stage leaves much to be desired. This deficiency arises in part from lack of the requisite technical personnel in several fields, but is due also to the absence of adequate arrangements for undertaking detailed studies well in advance of the time for their consideration and approval. It is, therefore, important that both at the Centre and in the States, work on the preparation of projects included in the Third Plan should be completed with the utmost speed. Further, project studies relating to the Fourth Five Year Plan should be taken in hand, so that they are substantially completed in the course of the next three years.

12. In the field of industrial and mineral development, unlike the more familiar fields of irrigation and power and transport, the existing technical organisations are not always adequate. To the extent to which this may be due to lack of experienced personnel, for some years at any

rate, there should be readiness to associate selected experts from abroad. It is suggested that the Central Ministries concerned with industrial development should take early steps to organise well-equipped technical planning cells. These should be maintained as permanent nuclei and should be supplemented by additional personnel according to the requirements of projects which are to be studied. The Ministries might also consider maintaining panels of technical advisers for selected industries. In this way the growing technical knowledge and experience of management and planning available within the country itself could be utilised in an organised manner in developing industry and specially the public sector. As suggested in the preceding Chapter, major State undertakings should take steps to strengthen and, where necessary, to set up suitable design and research units. Wherever feasible, the preparation of new projects should be one of their primary responsibilities. This would enable technical planning cells in the Ministries to concentrate on the broader technical and economic aspects of the projects with which they are concerned and on the study of different stages of execution and of the various related steps which require coordination at the level of policy and administration.

13. In connection with large projects, the question of the adequacy of existing arrangements for examination of cost estimates has arisen from time to time. A small beginning has been made with the setting up of a 'projects coordination cell' in the Ministry of Commerce and Industry, but the task has to be conceived on a much larger scale, and the arrangements needed should receive further consideration. Besides scrutiny of cost estimates and examination of economic aspects of projects, it is necessary that each year the Ministry of Finance should be in a position to present a report appraising the financial and economic aspects of all industrial undertakings of the Central Government.

14. Long gestation periods are a feature common to large projects. During the Second Plan, the gestation periods have in fact been much longer than had been estimated earlier. There are several reasons why continuous efforts should be made to reduce the time lags to the minimum. Large projects make a considerable claim on the available physical resources. It is important that there should be continuous flow of benefits from projects under execution at each stage in the Plan. The problem is essentially one of phasing work on each project with strict regard to the requirements and the provision of materials and of the ancillary services, including power and transport. There has to be a high degree of coordination between different stages or parts of the same project as well as in related sectors. Coordination is required both at the operational level and in the planning of parallel or complementary investments.

15. Management of projects is a relatively new and important part of administrative practice, of which the special features are that definite targets and time schedules have to be fulfilled, costs have to be reckoned strictly at each stage, a great deal of initiative and resourcefulness in execution are called for, and there must be adequate organisation for technical planning. Without advance planning and accurate estimate of costs, the success of a project cannot be assured. It is also essential that programming techniques should be improved continuously so as to secure at each stage the maximum benefits from the outlays incurred and to achieve the targets within the budgeted time and resources.

16. In large projects under the same overall management, there is need for special units to assist the management in keeping down costs, raising productivity, setting norms and checking performance. This will ensure that the physical assets created and the results achieved are commensurate with the investments made, the original estimates are not exceeded without sufficient reason, time schedules are maintained, and the responsible authorities are in a position to enforce efficiency, economy and integrity. It is suggested, therefore, that the Central Ministries as well as States concerned with large industrial and other projects should review the existing arrangements for achieving the objects mentioned above and should provide for suitable units for evaluation and review of progress which will function under the control of the top management authorities without, however, being involved in day to day operations.

17. A word may also be added here regarding certain aspects of implementation of Plan projects undertaken through private industry. The private sector has to make a large contribution to the growth of industrial production. Through the work of the National Productivity Council, Management Associations and other organisations greater attention is now being given to measures for increasing efficiency of management, reducing costs and, in general, inculcating in private enterprise the consciousness of responsibility to the community as a whole. In a planned economy in which the public and the private sectors have complementary roles, there must be equal concern in both for securing economies, utilising indigenous materials, saving on foreign exchange, outlays for maintenance of production as well as for development, accelerating exports, expanding employment, and, generally, improving the quality of service. Development Councils which have been set up for many industries and other organisations representing private industry are useful means for bringing the best leadership in each industry to bear on the solution of common problems and the achievement of high standards of management and welfare. They should be enabled to enlarge their contribution in these directions.

IV

PERSONNEL

18. Expansion of training facilities in various fields of development has received considerable attention since the beginning of the Second Plan. The training programmes proposed for the Third Plan are described in the Chapter on Technical Education. It may be useful here to draw attention to some aspects of the problem of developing personnel with the necessary outlook and experience which will have particular importance for the success of the Third Plan. There are certain fields in which, for many years to come, personnel at the highest level will be inadequate or experience of a specific character will not be sufficiently available. In these fields, in the interest of rapid development itself, it would be desirable for a period to arrange to supplement the available indigenous personnel.

19. In the past, there has been considerable under-estimation of the management implications of large projects as well as of programmes of development in different fields. To build up competent managers, who know their own job and have the ability to lead, is one of the key tasks in every sector of the Third Five Year Plan. For the most part, these men must be found from the middle grades of personnel within each organisation supplemented, to the extent possible, from other sources. Both within the Government and in projects, there has been greater pressure at the higher levels, and enough attention has not been given to the development of the middle grades of personnel. This object can be achieved if persons from these grades are given a greater share of responsibility in day to day work and have the opportunity of gaining experience in the higher functions of management. Along with this, within each project, it is essential to establish the practice of consultation and exchange of views as between different levels within the organisation as well as at each appropriate level.

20. Work in projects as well as in important programmes has frequently suffered because of rapid transfers of officials. For tasks of any importance, it is essential that the responsible officials should not only be selected with care and suitably trained, but should also remain long enough to grow to the full measure of their responsibility. In any major key assignment a period of less than five to ten years is rarely sufficient for producing large results. Frequently, in service transfers the factors which are taken into consideration are not of the first importance from the standpoint of public interest or the success of the undertaking. Transfers may sometimes injure both continuity of operations and the morale of organisations whose work at the present stage of development is nearly always of a difficult and pioneering character. There should be no hesitation in assuring the reasonable expectations of promotion to

persons who are required to continue on the jobs held by them in pursuance of public policy.

21. Large numbers of well-equipped public enterprises in different fields which are being developed throughout the country have facilities for arranging training on an extensive scale. In this respect, there is room for a much more positive approach than has been adopted hitherto. Wherever possible, each large project in the public sector should have a well-organised training programme for apprentices, etc. supported by institutional training at polytechnics or other appropriate centres.

V

Economy in Construction

22. In many fields of development, construction costs account for a substantial proportion of the expenditure. There is considerable scope for saving on construction costs if attention is given to certain elementary aspects. While each major construction has its own special features, there are five groups of factors which specially influence costs:

(1) Planning, investigations including those of raw materials, designs, specifications including those for equipment, detailed estimates, and preparation of the project including phasing of its component elements for optimum results, and financial returns;

(2) Essential preliminaries for construction like staffing, land acquisition, communications, housing, policy and procedure for procurement of plant, equipment, stores, etc.;

(3) Choice of construction agency, whether departmental, contract, labour cooperatives, voluntary organisations, etc. and system of contract, codal contract or work order;

(4) Contract procedures such as security deposits, earnest moneys, issue of materials, procedure for payments, interval between execution of work and payment, deviation from original specifications or scope and claims for extra items; and

(5) In the administrative set up, delegation of powers, place of Accounts Officer vis-a-vis Chief Engineer, responsibility and the adequacy of support, trust and authority vested in the principal executive to discharge that responsibility.

With due care and supervision, it should be possible in most cases to avoid unjustified excesses over estimates of costs as well as delays in keeping to the time-schedule for completing the work.

23. The question of securing economies in construction has been considered in consultation with Central Ministries and State Governments and there is general agreement on the following measures:

(1) Before a project is undertaken, there should be adequate planning of all aspects of the project, specially investigations, including those concerning materials for construction, and a detailed project report giving layout of works, details of equipment, phasing of component units of the project, cost estimates, financial returns, etc.;

(2) Simultaneous steps should be taken to arrange for essential preliminaries of construction, namely, land acquisition, housing, communications, recruitment of staff and laying down procedures for procurement of plant and equipment and stores, and materials budgeting should be undertaken in detail;

(3) Adequate workshop facilities should be provided for installing machinery and for repairs and overhaul during construction. The workshop should also provide training facilities for mechanical, electrical and other personnel required for operating construction machinery;

(4) In planning for mechanised construction, the need for large-scale employment being an essential objective of the Plan, a careful balance must be struck between use of manual labour and machine; the use of machinery should be restricted to only those works which, if done by manual labour, would be unduly delayed or would become much more expensive, or which are impossible of execution through manual labour;

(5) A careful assessment should be made of the spare parts required for construction machinery and other stores, and provision should be made accordingly so that, on the one hand, the work is not held up for want of essential stores and spares being available when required and, on the other, there is no unnecessary accumulation of inventories;

(6) A central design organisation should be set up for the project if it is of sufficient magnitude or for a group of projects of smaller magnitude, which will prepare detailed designs, field plans, specifications of machinery and of civil works, including specifications for materials of construction. This organisation should also prepare designs for buildings and lay down norms regarding space utilisation;

(7) Buildings should be planned and designed on the basis of functional needs. Cost reduction can be further secured consistently with these needs by putting up temporary or semi-permanent construction to the extent possible. With optimum space utilisation, standardisation, suitable type designs, prefabrication, adoption of improved techniques and control or elimination of items which are not essential for the functional needs of the building, considerable economies can be effected;

(8) Choice of construction agency, system of contract and contract procedures are the most important factors, besides planning and design, which determine the ultimate cost of the project. The agency of construction can be departmental, or through contractors or voluntary organisations and labour cooperatives. In the case of non-departmental agencies, the work can be awarded on a codal contract or a work order system. A judicious choice between the agency of construction and the system of contract will bring about appreciable cost reduction. Departmental construction and construction through voluntary construction agencies and labour cooperatives will avoid unnecessary dependence on contractors and also divert the profits from the individual to the community. Voluntary organisations and labour co-operatives should be encouraged and work awarded to them on the work order system as far as possible;

(9) Promptness in payment of running as well as final bills is one of the most important factors in cutting down costs. Monthly on-account payments should be a normal feature. Claims for extra items, unless approved in advance, should be definitely rejected;

(10) Training of personnel for purposes of improving skills and productivity should be an integral part of the construction organisation;

(11) In the interest of continuity and building up of expertise, transfers of essential technical personnel from construction should be avoided even though such action may militate against departmental rules or conventions, and the interests of such personnel safeguarded within the construction organisation;

(12) A 'Cost Reduction Unit' should be established in each major construction project as a part of the construction organisation under the exclusive control of the Chief Engineer of

the project. Its functions will be to carry out work studies, continuously analyse factors affecting costs, recommend suitable adjustments from time to time in materials, techniques, procedures and organisation, evaluate the results of such adjustments and keep a watch on progress in achieving economies in construction costs;

(13) A pool of technical advisers for each type of undertaking should be maintained at the Centre who, with the background of their experience and knowledge and the further pool of knowledge made available to them by the design and construction organisations and the cost reduction units, will advise on the technical, economic and administration aspects of the project and also serve as a clearing house of information. As far as possible expenditure on this pool should come out of the savings in cost secured through its advice; and

(14) For each major project, a comprehensive completion report should be prepared giving the entire history of the project, including mistakes which occurred and risks taken, remedial measures adopted and lessons drawn, so that this report may serve as a reference book and guide to engineers charged with the execution of similar projects in the future. The preparation of the completion report should be begun while the works are in progress, and events fresh in memory and the report completed, as far as possible, simultaneously with or soon after the completion of the project. Technical bulletins dealing with various aspects of design and construction should also be prepared at the same time.

24. It has been suggested to States that they might set up inter-departmental committees to watch progress in achieving economies in construction costs. A number of States have already set up such committees. A committee on these lines is also being constituted at the Centre. Through the establishment of such machinery for following up the various suggestions mentioned above, it should be possible to insist that when a development programme or project comes up for general approval the construction element is also fully considered. This will further secure that construction programmes in each field are phased so as to lead to the largest measure of economy.

VI

Implications for Planning

25. As the Second Five Year Plan progressed from year to year, it was felt that with greater anticipation and more accurate statistical and economic intelligence some of the problems might have been dealt with

differently. In the first phase of the Plan, the decline in foreign exchange reserves might have been spread over a longer period, and the consequent reductions in foreign exchange allocations might have been less drastic in relation to power development and the production of fertilisers. The considerable lags which occurred in the utilisation of irrigation from large and medium irrigation projects could have been reduced. The shortages and imbalances recently reflected in the difficulties of coal transport could have been countered in advance to a greater extent. Finally, the intensity of fluctuations and the rise in prices during the past two years might have been moderated. These are instances of the interdependence between the balance of payments and the internal price levels, of the scheme of investments and the resulting outputs, and of developments in the related sectors of industry, transport and power. They point to the much larger dimensions of the problems of management, planning and implementation which are inherent in the design, structure and phasing of the Third Five Year Plan.

26. These problems arise not only at the national level and in the sectors of modern industry, transport and power, but are also reflected in turn in the greater responsibilities thrown upon the plans of States. In many sectors the role of planning in the States is wholly complementary to that of planning at the national level, and problems at the State level also become more complex. The line of communication between planning for the country as a whole and for each district, block and village is a long one; to be able to preserve the broad national priorities while seeking to adapt the Plan in its myriad forms to the conditions and needs of each area and each community is no small objective. Against this background, a fresh view has to be taken of the ways in which the machinery and the process of planning at various levels may be improved, evaluation made more incisive, and planning equipped with better statistical and other tools. These are problems to be considered further in consultation with the Ministries at the Centre and the State Governments. Some of the principal directions in which the existing schemes and organisation of planning may be strengthened may be briefly indicated.

27. Unlike the earlier phases of planning, large projects in industry, transport, power and other fields, which involve complex technical and economic problems and vast amounts of expenditure, have now an increasingly important place in national planning. As the body entrusted with responsibility for planning at the national level, the Planning Commission will endeavour to keep in touch with the working of large industrial and other enterprises and assist Ministries and States with objective analysis and reporting from the wider considerations of the national economy as a whole. From this angle the Planning Commission's own work and that of the Committee on Plan Projects and the Programme Evaluation Organisation are being reviewed. Its

will be necessary to ensure close collaboration with various statisticial agencies and also to enlarge the scope of the economic and social research to be undertaken both directly and through universities and other centres of learning.

28. In collaboration with the Ministries and the States considerable improvement will need to be effected in the present system of reporting upon projects, flow of information at intervals short enough to be meaningful, and assessment of current trends. Too frequently in the past, reports on progress have lacked focus and have not brought to light current weaknesses or helped to anticipate problems requiring action at different levels.

29. Large burdens are being placed on planning organisations in the States. States are called upon to interpret national objectives, translate them in terms of the needs, resources and possibilities open to them, carry the Plan to the remotest points, and find ways of mobilising local resources and enthusiasm. Within the limits of its tasks as conceived thus far, the machinery for planning in the States has served well. It has enabled Departments to undertake the responsibilities assigned to them with coordination being provided by the Chief Minister and a Cabinet Committee and, at the official level, by the Planning Department and the State Development Commissioner.

The crucial role of State plans in fulfilling the economic and social objectives of the Third Plan has been described earlier. During the next three years States will also participate in the drawing up of a long-term plan of development for the country on the lines explained in Chapter II. This plan is intended to present the general design of development for the country as a whole over the next 15 years or so. It will be based on a study of the resources and possibilities of different parts of the country and will seek to bring them together into a common frame. This is a task of great complexity, as it is of great promise, and there will be need for close and continuous collaboration between various agencies at the Centre and in the States, especially those responsible for planning, as well as leading institutions in the country engaged in scientific, economic and social research. From this aspect as well as the implementation of the Third Plan and the preparation of the Fourth, it will be necessary for States to consider the lines along which the existing arrangements and machinery for planning at the State level should be further strengthened.

30. The introduction of democratic institutions at the district and block level and the role of Panchayats at the village level are held rightly to offer the means for mobilising the manpower and other resources of the people throughout the country. Yet, this momentous change itself places much greater responsibility upon Departments at the State level, technical and other officials at the district level and extension workers

in the blocks. The success of the Plan, as of panchayati raj itself, will depend upon a correct approach to various problems being adopted from the start both by the representatives of the people and the official agencies. The right approach to these problems is vital for fulfilling the targets of the Plan in many key sectors. This aspect is considered further in the Chapter on Community Development.

31. Finally, in the plans hitherto formulated urban areas have not been actively associated. It is envisaged that in the next phase of planning, as many towns and cities as possible and, at any rate, those with a population of 100,000 or more, should come into the scheme of planning in an organic way, each city mobilising its own resources and helping to create the conditions for a better life for its citizens. The necessary preparation for this should begin early in the Third Plan.

CHAPTER XVIII

PUBLIC COOPERATION AND PARTICIPATION

APPROACH

PUBLIC cooperation has been recognised as an essential condition for the success of our Plans. Its role and contribution have to be judged in relation to the social and economic objectives that the country is seeking to achieve. For a developing country which cherishes its democratic values, the people's part in the attainment of these objectives is of supreme importance. The peaceful struggle for freedom and the tradition of constructive work associated with it had marked out for the people a decisive role in the tasks of planned development initiated ten years ago. Shramdan, the contribution of the people to local works and amenities, and their participation in the community development movement are among the ways in which their support has been enlisted in the tasks of national development. It is evident, however, that the possibilities of full involvement of the people in the processes of change and growth are not being realised to a sufficient degree.

2. In the context of democracy, administration is effective in the measure it is based in its day-to-day working on the participation and support of the people. In the activities in which official agencies are engaged there is a large sphere in which the cooperation of the people can be sought and secured to achieve a degree of success which would otherwise not be possible. These tasks should be identified precisely and the obligations and responsibilities of the people in relation thereto made known clearly.

3. The people in the rural areas are now coming into their own. Direct responsibility for the administration of their affairs is being passed on to them as panchayati raj gets established in one State after another. The transformation now occurring at the base in the country-side, and emerging from panchayati raj, is intended to facilitate the fuller play of the energy and initiative of the people in dealing with the tasks which lie close to them in the villages of the country. Conditions are being created for a fuller use of the manpower and other resources in order to secure more rapid development in every direction. This will also widen very much the opportunities for public participation.

4. The concept of public cooperation is related, in its wider aspect, to the much larger sphere of voluntary action in which the initiative and organisational responsibility rest completely with the people and their

leaders, and does not rely on legal sanctions or the power of the State for achieving its aims. So vast are the unsatisfied needs of the people that all the investments in the public and private sectors together can, at this stage, only make a limited provision for them. Properly organised voluntary effort may go far towards augmenting the facilities available to the community for helping the weakest and the most needy to a somewhat better life. The wherewithal for this has to come from time, energy and other resources of millions of people for whom voluntary organisations can find constructive channels suited to the varying conditions in the country. Everyone can contribute something. But the greater obligation in this regard lies on those who are better placed. Applied on a mass scale, as was done in the construction of the Kosi project, the results of public participation in terms of savings of both time and money can be tremendous. Material gains to the nation from this source can be widespread and large. What has been achieved so far on this account is, however, of small proportions. There should, therefore, be an early appraisal of the activity in this field to remove hindrances in the way of a much more massive advance.

5. The transition from a state of economic and social stagnation and the initial period of advance are attended with social and political hazards, especially in the case of a country where political freedom is of recent occurrence. The new awakening brings to the fore pressing claims and expectations but the sense of duty and obligations lags behind. The development process also imposes a measure of sacrifice and forbearance. When the democratic structure and values have to be preserved, these strains and stresses become greatly accentuated. To counteract this and to create a social and political climate conducive to smooth progress must be the primary concern of a developing nation. In this field, social action has a pre-eminent role.

6. Uneven distribution of the fruits of progress, which is associated to an extent with the early stages of development in a democratic society, gives rise to a sense of deep resentment and frustration.[1] This is greatly heightened by the spectacle of fortuitous incomes and gains from anti-social activities. Sharp conflicts, which stem from narrow sectional and regional interests, have arisen in India occasionally. It is not possible to provide full satisfaction for the rising expectations of various sections and regions at this stage. At the same time, there are forces at work which exploit all kinds of discontents and tensions, and pose a threat to the solidarity of the nation. While action has to be taken at political and administrative levels to curb these tendencies, the most effective means of combating this evil is for the community itself to strengthen its own defences and repel from within the attacks on the integrity of the nation. This protective strength can come chiefly from voluntary service and constructive activities organised by the people themselves.

Explosive situations do not develop suddenly and when outbursts occur they are only symptoms of a malaise which has existed and grown over a period of time. Remedies applied at the moment can have only a limited efficacy. Wrong influences and destructive trends have to be neutralised constantly by positive forces that should be generated within the community all the time. This is, in the first instance, a task of widespread social enlightenment. Appeals made at the last moment are usually not heeded. It is through the quiet influence of voluntary workers, steadily engaged in acts of selfless service into which a large section of the community is drawn, that the voice of reason can prevail. Constructive work and comradeship in unselfish activity are a sure basis for progressive and healthy group life in a community which is exposed to a variety of disturbing impacts. In the circumstances of our country, these facts and considerations invest social action and public cooperation with a deep significance.

PUBLIC COOPERATION IN THE FIRST TWO PLANS

7. The distinctive feature of public cooperation programmes is the presence of the contribution of voluntary service on a considerable scale. This became available in the earlier years chiefly for construction of roads and school buildings, drinking water schemes and other local works to provide simple amenities for the people.

8. Over the past decade voluntary contributions in the community development programmes, in cash, kind and service, have been estimated at about Rs. 100 crores. The people's quota in local development works amounted nearly to Rs. 15 crores out of a total expenditure of Rs. 33 crores. Welfare programmes of the Central Social Welfare Board and those relating to the welfare of backward classes and emergency relief schemes were implemented largely through voluntary organisations. The intensive area scheme of the Khadi and Village Industries Commission bases itself to a considerable extent on people's own effort and local resources for creating additional employment opportunities through village industries. The midday meal and school improvement schemes in Madras are being executed with a large measure of support from the people. Bhoodan and gramdan movements, in which the Sarva Seva Sangh workers are actively engaged, are an outstanding demonstration of the potentialities which reside in voluntary action stimulated by high idealism and a missionary zeal. The University Planning Forums have succeeded in drawing a large number of teachers and students with various socio-economic programmes such as small savings, literacy, slum clearance and improvement and construction schemes involving volutary work.

9. It was realised at the time of the formulation of the First Five Year Plan that for rapid progress public cooperation will have to be

enlisted on a very large scale in every aspect of development. The Bharat Sevak Samaj was formed to provide a common platform with the object of drawing out the available unused time and energy of the people and directing them into various fields of social and economic activity. The Samaj has adopted a comprehensive programme and has branches all over the country. It has a large cadre of trained workers. Its association with the Kosi project during 1955-59 has brought forth evidence of the large possibilities of reducing cost, improving quality of performance and speeding up completion of various projects through public participation. Against the original estimates of Rs. 11·5 crores, the actual expenditure on the Kosi embankment scheme came down to Rs. 6·5 crores. The work was completed in 1958 against the target date of 1960, i.e. 2 years in advance. The Samaj has taken part on a smaller scale in the construction of several other irrigation and flood protection projects. Encouraged by its experience it has set up a Construction Service with branches in several States. It has undertaken construction of a variety of public works. The organisation of works camps for students and youth of the country in connection with the Labour and Social Service Camps scheme of the Ministry of Education has become a major activity of the Samaj in which the contribution of the people is becoming available in an increasing measure. A specific approach has now been worked out in respect of activities in the rural areas. A group of villages is selected as the field of activity of two or three trained social workers whose task it is to develop, in an integrated manner, people's programmes on the basis of a plan for the area. The Lok Karya Kshetra aims at developing new resources for the area and creating local leadership. This programme receives assistance from the State and is now being shared by other voluntary organisations. To create social awakening and disseminate information about the problems of the country and the various Plan programmes, the Samaj has set up Jan Jagran (social enlightenment) centres. This is an assisted activity which is now becoming an integral part of the Lok Karya Kshetra programme. In the urban areas, the Samaj has given special attention to the problems of the slum-dwellers and has been running a number of night shelters for the homeless.

10. There are several other organisations which are functioning at the national level and have done valuable work in attending to the specific needs or sections of the community. Considerable progress has been made in the coordination of the activities of these bodies. The National Advisory Committee on Public Cooperation makes a periodical review of the progress in the field of public cooperation and lays down lines of guidance. Among the organisations who are members of this Committee are All India Cooperative Union, All India Women's Conference, Bharat Sadhu Samaj, Bharat Scouts and Guides, Bharat Sevak Samaj, Bharatiya Adim Jati Sangh, Bharatiya Grameen Mahila Sangh,

Central Social Welfare Board, Gandhi Samarak Nidhi, Harijan Sevak Sangh, Indian Conference of Social Work, Indian Council for Child Welfare, Indian Red Cross Society, National Cadet Corps and Auxiliary Cadet Corps and Satva Seva Sangh.

PRIORITIES AND PROGRAMMES

11. *Welfare.*—With so much poverty and ignorance in the country, there is no limit to the scope of voluntary service in mitigating the hardships of the under privileged and in creating a better environment for them. In view of the present limitations of personnel and resources some consideration of priorities becomes inevitable. A great deal still remains to be done to promote healthy habits and clean surroundings in rural as well as urban areas. Concerted voluntary action can produce gratifying results in this sphere without much cost. Services can be rendered to patients in hospitals and to the ailing persons who cannot be looked after in their homes. The spread of literacy can be greatly accelerated through voluntary help. To bring about social reforms and to rid the community of social evils and anti-social activities, the sanctions of law can have only a minor role, and the brunt of the challenge must be borne by voluntary organisations.

12. *Socio-economic programmes.*—The emphasis of voluntary service is now shifting from welfare, in the restricted sense, to the realisation of broader socio-economic aims. Voluntary organisations can play a very useful part in creating the climate and conditions favourable to smooth and effective functioning of panchayats and cooperatives. In rural areas, the two outstanding tasks are to assist in the fuller utilisation of the material and manpower resources so that both production and the opportunities for gainful employment may increase continuously. For this purpose, voluntary workers have to give to the community development organisations all the assistance they can.* In towns and cities voluntary service should be directed chiefly towards improving the slums and creating better living conditions for those who must live there. Organised self-help must be the basis of this and the other activities undertaken by voluntary agencies. The cooperative movement in its many phases is a field parexcellence which can absorb services of a large number of social workers. The building up of a network of service cooperatives in rural areas and cooperative consumer stores in urban areas is an urgent national need which should receive immediate attention.

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* Among the fields of activities for voluntary organisations suggested in a Conference, recently convened by the Ministry of Community Development, are social education, agriculture production programmes, village industries, sanitation and hygiene, local development works, welfare of weaker sections of the community, women and child welfare and youth programmes.

13. *Construction.*—Construction activity in the bigger projects as well as smaller and local works will remain the largest avenue for voluntary effort towards the utilisation of idle manpower. In villages, voluntary agencies will be encouraged and helped to take up construction work directly or through labour cooperatives. This will lead to reduction of cost, observance of satisfactory standards of work, a better deal for the construction workers and the promotion of honest dealings in the working of the construction industry. Excessive dependence on contractors will be avoided and additional resources will become available for the programmes of the voluntary organisations. A Committee set up in the Planning Commission has made the following recommendations to enable the voluntary organisations like the Bharat Sevak Samaj to undertake construction work on a large scale:

(a) It should be the effort of the official agencies to give maximum assistance to voluntary organisations. As far as possible, a certain proportion of the available work should be set apart for them and extended as their capacity develops.

(b) Continuous flow of work should be ensured. The project authorities should indicate well in time the magnitude, types and specific works that can be awarded to such organisations. They should be given preference over the private contractors and, where possible, given works on a negotiated basis.

(c) Works may be awarded at workable rates on (i) 'work-order' basis; and (ii) the basis of schedule of rates increased or decreased by a percentage decided by a competent authority. The schedule of rates should be kept uptodate.

(d) Delay should be avoided and prompt payment ensured. Powers may be delegated to the Superintending and Executive Engineers and 'on account' payments may be authorised for works completed.

(e) Technical personnel may be deputed by the State Governments and the Central Ministeries to assist the voluntary organisations.

(f) Loan assistance should be given for working capital and purchase of equipment.

(g) Subject to proper assessment of their capacity, the voluntary organisations may be considered for all kinds of earth-work and simple masonry works. They may be given major structures if and when they are adequately equipped with technical manpower and necessary mechanical equipment. They may also be encouraged in undertaking contracts for supply of building material in bulk quantity.

14. *Better understanding of our Plans.*—For enlisting widespread participation and voluntary effort in the reconstruction of social and economic life, understanding and appreciation of the significance, objectives and priorities of the Third Plan will be of considerable help. This is by no means an easy task in view of the growing complexity of the economy and of the many problems to be faced. On the other hand, as a result of the first two Plans and the awakening to which they have led, there is much greater ability to grasp the nature of the problems, the limitations within which solutions have to be found and the need to bear larger burdens for achieving rapid economic development. In the last resort, the Plan becomes meaningful in terms of the tasks it sets and the opportunities it provides to individuals, local communities and different sections of the population. As part of the programme for strengthening public cooperation and participation during the Third Plan, it is proposed to intensify the existing arrangements for bringing home the implications of rapid development and carrying the message of the Plan to the masses throughout the country.

15. *Wider aims.*—There are certain higher tasks which are related to the basic needs, ideals and goals of the nation. In the present circumstances, they create special obligations for the people. The foremost need now is that the attitudes of the people and the pattern of conduct, which prevail in the community should be in harmony with the national purposes. There are three constituents of this pattern which may be regarded as the most essential in this context. In the first place, love of the nation and faith in its great destiny should become the dominant feeling in every heart. By common consent, whatever tends to impair the integrity and unity of the country should be held up to public censure. There should be a growing understanding of what kind of behaviour will hurt the cause of national unity and with what consequences. Dedicated workers can in a hundred ways help to project the image of a strong and united nation in the consciousness of every citizen. They can create the realisation how important and indispensable the united endeavour of the people is for every thing of value which the individuals and groups in the country can seek and aspire after. Voluntary organisations with links in different parts of the country can help to create a sense of oneness and a common outlook by engaging the people in simple activities of service to the community which are performed all over the country as a great national programme. Secondly, it is envisaged that progressive socialisation and cooperative growth should be the basis of the social and economic order that is being created in this country. Thirdly, it should be remembered that it is only on the basis of right living that a strong nation and a just social order can be built. Every one will have to work for the good life which all can share. A society in which many must suffer so that a few may prosper is to be disfavoured. To bring this about basic changes are needed in the habits and outlook

of the people which may reflect a keen appreciation of social justice and our common humanity. Certain norms of behaviour, with accent on restraint, discipline and consideration for others, have to be cultivated and woven into the fabric of national character. Stress should be laid on the observance of 'Sadachar' (moral and social standards) in political and social relations and in all our business and economic activities. When social change of a large order has to be achieved in a relatively short period, the people's part in respect of scale and intensity of effort has to be such as to impart to it the character of a mass movement. Here is a limitless horizon and the widest scope for voluntary service through people's organisations. It should be realised that what is confronting us now is the call of a revolution to which people's mind must get attuned. The idealism and patriotic devotion of the people will find their highest expression in the service of this revolution.

Organisation and Techniques

16. Since so much is expected of public cooperation and participation through voluntary organisations, it is important that they should grow in strength and dimensions so as to be capable of discharging their self-imposed obligations adequately. This will depend very much on the extent to which they inspire confidence by the proper and efficient execution of the programmes they undertake and the contribution they make to the satisfaction of the felt needs of the people. The spare time and other resources placed at their disposal must be put to the most effective use. This points to the need for advance planning, a proper assessment of requirements, training of personnel, systematic execution and adequate supervision and evaluation.

17. Voluntary organisations should establish a relationship of intimate collaboration with local bodies and for certain purposes act as agencies of the panchayats, municipalities, etc. The programmes which call for cooperation of the people may be framed jointly and the role and place of voluntary organisations should be clearly specified. Official agencies should provide them with assistance and facilities to the maximum extent but their direction and control must be scrupulously left to the leadership of voluntary organisations. In this way alone, these organisations can acquire a national character and make an appeal to all citizens irrespective of their political affiliations. In response to local needs small units of voluntary workers are formed in many places. They should be encouraged and helped by the larger bodies to enable them to make a more effective contribution. This assistance may take the form of training of the workers, guidance and provision of various facilities.

18. Spontaneous development of activities on a voluntary basis is welcome but there is a danger of duplication and frittering away of valuable energy and resources. Voluntary organisations should, therefore, develop

a common approach, work in close collaboration and specialise in certain fields for which they are best equipped. A measure of coordination has already been achieved. This may usefully be extended to cover a variety of activities including training, research, pilot projects, pooling of information and experience, publication of journals and guiding material and dealing with official agencies.

19. Voluntary activities have so far drawn their sustenance from individuals and such assistance as the State has been able to furnish. A strong base for voluntary service can be created if it can derive support from a large number of institutions and establishments in the field of education, entertainment, business, journalism, etc. They can help in raising funds through collection drives and charity shows. They may also accept responsibility for some specific jobs. They can render much useful service by permitting the use of their accommodation, equipment and other facilities, outside working hours for programmes and activities of voluntary organisations.

20. The personnel for voluntary organisations has to be drawn from all walks of life specially from amongst social workers, teachers, members of various professions, members of Legislatures and local bodies and public servants. Persons retired from active service, either in civil occupations or the army, have given a good account of themselves in this field, and can be drawn into these activities in much larger numbers. The mainstay of this movement will have to be the youth of the country who can be enlisted and trained for activities aiming at their own welfare and the common good.

21. After a period of trial and experimentation, the concept of Lok Karya has been evolved to impart to non-official voluntary action the required degree of planning and continuity. The Lok Karya Kshetra, which corresponds to the area of an N.E.S. Block, would offer a common platform for voluntary bodies and bring about an integration of their various activities at the field level. The study of Lok Karya Kshetras undertaken by the Programme Evaluation Organisation has shown that workers in this programme are able in a special measure to bring intimate knowledge of the people and their problems to the task of mobilising local resources and manpower and overcoming such barriers to development as ignorance, factions and inadequate facilities for extension work in the villages. The approach is now being extended to urban areas also.

22. University Planning Forums are expected to play an increasing role during the Third Plan in bringing universities and colleges into closer contact with the larger community and in enabling teachers and students to contribute towards national development in constructive programmes undertaken in collaboration with panchayati raj institutions, municipal bodies and voluntary organisations. Studies and surveys undertaken

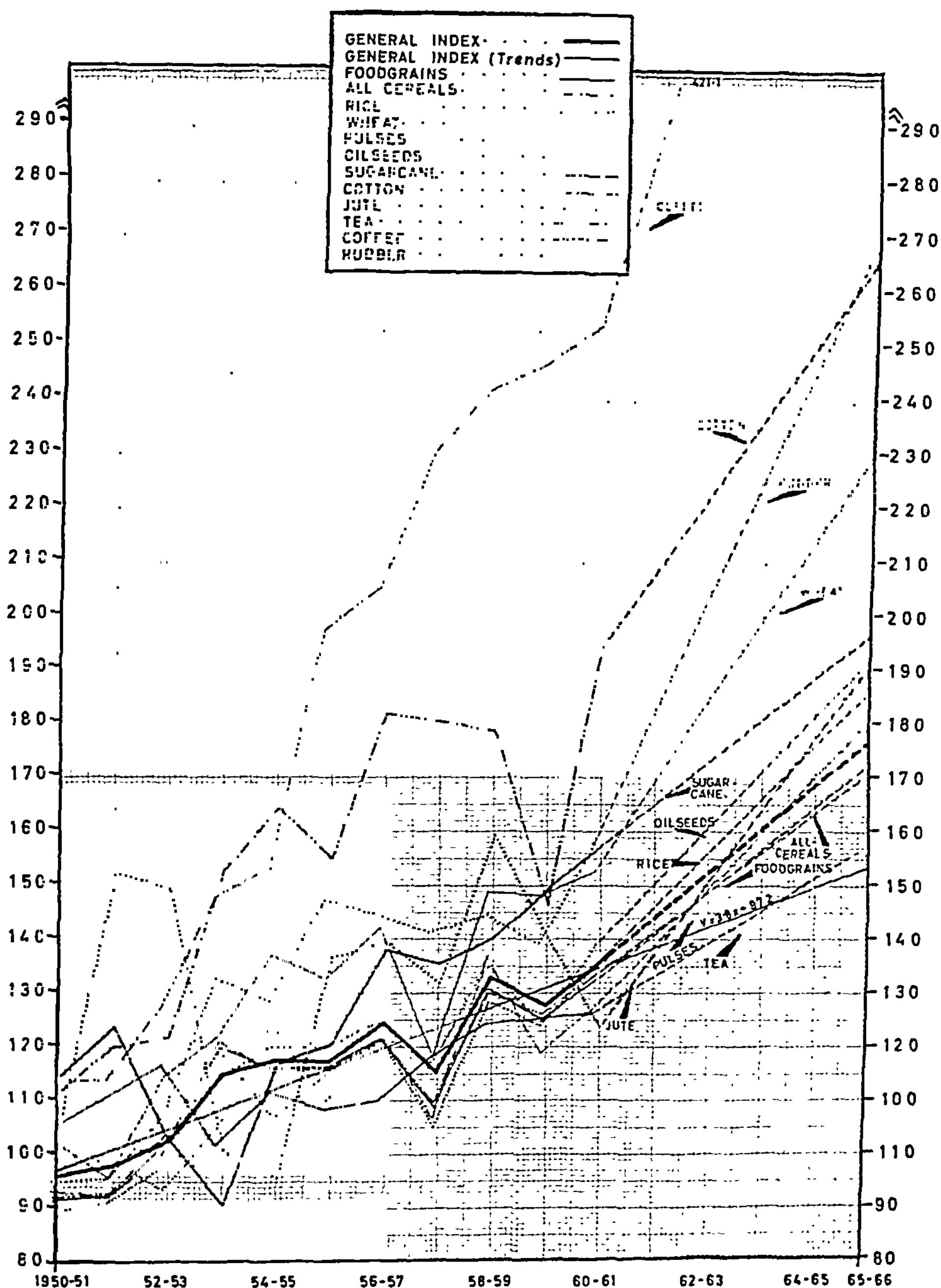
during the Second Plan by teams constituted by planning forums have afforded useful opportunities to students and youth to gain insight into social and economic problems and valuable suggestions have been thrown up at seminars organised by planning forums from time to time. These and other activities will be further developed during the Third Plan. It is also hoped that planning forums may be able to organise Plan information centres which will help students to identify themselves more and more with the goals for which the nation will strive during the Third and subsequent Plans.

Training, Research and Evaluation

23. The tasks before the workers engaged in activities relating to public participation are by no means simple or easy. Their primary concern is to change the outlook of the people, win their confidence and stimulate them into new endeavour. They are faced with considerable inertia and conflicting social forces at work. Complex social conditions and problems are encountered. To be able to do their part reasonably well, these workers must receive intensive training of a special kind. This aspect had been largely neglected till recently, when for the workers of the Lok Karya Kshetra programme, training facilities were provided on a regular basis. Training of part-time and whole-time workers from the village upward should be undertaken on systematic lines, so that they may be enabled to carry out their duties with an amount of skill and understanding. To create a sound basis for training programmes and to develop suitable methods and techniques of public participation, the current experience should be subjected at intervals, to close study and analysis. Group discussions should also be organised for this purpose. There is a large scope for research into the dynamics of social change, the attitudes of various groups towards problems and programmes placed before them, and the effectiveness of techniques employed for securing cooperation and participation of the people. Pilot projects to test new ideas should be taken up in different parts of the country. Facilities should be provided for evaluation of the activities of the voluntary organisations. The results of these studies and experiments should be embodied in suitable literature and guidance material.

INDEX OF AGRICULTURAL PRODUCTION

BASE 1949-50 = 100



CHAPTER XIX

AGRICULTURAL PRODUCTION

PROGRAMMES of agricultural production lie at the base of the comprehensive approach to the reconstruction of the rural economy which is embodied in the Third Five Year Plan. Development of irrigation, from large as well as small works, soil conservation programmes and supplies of fertilisers, improved seed and credit, along with the provision of extension services reaching down to the village level, are measures undertaken directly to increase production. In support of these programmes, through the community development movement, the energies of each village community as a whole are sought to be harnessed and its manpower and other resources effectively mobilised. Land reform policies aim at removing impediments to greater production due to the agrarian structure inherited from the past and to prepare the way for the development of a progressive agriculture organised on a cooperative basis. The various programmes of cooperative development which have been undertaken and will be given still greater emphasis in the Third Plan are intended to build up the necessary institutional framework for rapid economic development in rural areas such as will be of special benefit to the weaker sections of the rural population. Schemes for increasing agricultural production are closely bound up with the success of animal husbandry and dairying and the development of fisheries and of rural industry. From the aspect of long-term development, care of forest wealth, conservation of soil and moisture and the growing of village fuel plantations are of great importance. In some parts of the country rural electrification is already beginning to make a significant impact on rural life through extension of irrigation and speeding up of technological change; this impact will become progressively larger. These various aspects of agricultural development and, in particular, the specific programmes for increasing agricultural production for which the Plan provides, gain in significance when seen against the wider background of the large-scale transformation in rural life which is being brought about through successive Five Year Plans.

PROGRESS UNDER THE FIRST AND SECOND PLANS

2. By the end of the Second Plan, the index of agricultural production (base-1949-50) rose to 135, the index for foodgrains being 132 and that for other crops 142. In the First Plan, agricultural production rose by about 17 per cent. During the Second Plan, two years out of five—1957-58 and 1959-60—were unfavourable, and the overall increase

in agricultural production amounted to about 16 per cent. The following Table shows the production trends since 1949-50*.

Table 1: Agricultural production—1949-50—1960-61.

commodity	unit	1949-50	1950-51	1955-56	1956-57	1957-58	1958-59(a)	1959-60(b)	1960-61(c)
rice	million tons	23·7	20·9	27·1	28·6	24·9	30·4	29.3	32·0
wheat . . .	,,	6·6	6·6	8·6	9·3	7·7	9·8	9·7	10·0
all cereals . . .	,,	48·4	43·7	54·9	57·4	53·0	62·6	60·5	64·0
pulses . . .	,,	9·2	8·5	10·9	11·4	9·5	12·9	11·2	12·0
foodgrains (cereals and pulses) . .	,,	57·6	52·2	65·8	68·8	62·5	75·5	71·7	76·
oilseeds	,,	5·1	5·1	5·6	6·3	6·1	6·9	6·4	7·1
sugarcane (gur) . .	,,	4·9	5·6	6·0	6·8	6·9	7·1	7·6	8·0
cotton	million bales	2·6	2·9	4·0	4·7	4·7	4·7	3·8	5·1
jute	,,	3·1	3.3	4·2	4·3	4·1	5·2	4·6	4·0
all commodities (index number) . .		100	95·6	116·8	124·0	114·6	132·3	127.2	135·0

3. Before the Second Plan took final shape, it was realised that the programme of economic development with special emphasis on heavy industries which the Plan embodied would demand a larger increase in agricultural production than had been at first envisaged. Accordingly, *in consultation with State Governments, the initial targets were reviewed,* and in November, 1956, the following revised targets were proposed: foodgrains, 80·5 million tons; oilseeds, 7·6 million tons; sugarcane (gur), 7·8 million tons; cotton, 6·5 million bales; and jute, 5·5 million bales. The level of food production in 1960-61 which has been shown in the Table above at 76 million tons is expected to reach about 78 million tons when the revised estimates of crop production become available. The Second Plan target for the production of sugarcane has been exceeded; on the other hand, there has been stagnation in cotton and jute. In oilseeds also, production has fallen below the target. In view of the production trends during the Second Plan, it is of the highest importance that in the Third Plan, besides achieving self-sufficiency in foodgrains, substantial increases should be secured in commercial crops, specially cotton, oilseeds and jute. With the growth of the economy and increase in domestic demands as well as the need to step up exports, success in increasing the production of commercial crops is as vital as increase in the production of foodgrains.

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* The coverage of crop statistics gradually increased in the course of the First Five Year Plan and from time to time changes were also introduced in the techniques of estimation. The estimates of production of foodgrains in the table have been adjusted to suit these changes upto 1956-57.

(*a*) Partially revised estimates

(*b*) Final estimates.

(*c*) Provisional.

4. In the Second Plan, out of a total anticipated outlay under agriculture and community development of Rs. 529 crores, agricultural production programmes accounted for about Rs. 290 crores. In addition, there was a total outlay of Rs. 372 crores on major and medium irrigation schemes. In the course of the Plan additional resources were provided for minor irrigation. The following Table summarises information received from State Governments regarding progress in carrying out programmes of agricultural development.

Table 2: Agricultural programmes—progress in the Second Plan

programme	unit	estimated achievement
major and medium irrigation	million acres (gross)	6·9
minor irrigation	,,	9·0
soil conservation on agricultural lands	,,	2·0
land reclamation	,,	1·2
area under improved seeds (foodgrains)	,,	55
consumption of nitrogen (N)	thousand tons	230
consumption of phosphatic fertilisers (P2 O5)	,,	70
urban compost	million tons	3
rural compost	,,	83
green manuring	million acres	11·8

Apart from the influence of unfavourable seasons, greater progress might have been achieved in agriculture during the Second Plan if the benefits of the substantial investments incurred, for instance, in the extension of irrigation, both from small and large irrigation works, and in the establishment of seed farms could have been realised more speedily. Programmes which require large-scale participation on the part of the people, such as, soil conservation, made only limited progress. The consumption of fertilisers, which has been recently stepped up to a considerable extent, increased very slowly during the first four years of the Second Plan. This was due both to the shortage of foreign exchange and to the inadequate progress made in establishing the new fertiliser plants. When the agricultural targets for the Second Plan were reviewed in 1956, it was specially emphasised that programmes for the multiplication of improved seeds, for the use of fertilisers and for irrigation, soil conservation, etc., would be implemented so as to yield the maximum benefits within the shortest time. It was envisaged that there would be carefully worked out programmes for covering every acre of land enjoying irrigation or assured rainfall with improved seeds and that the supply of fertilisers and organic and green manures would be ensured. Sufficient progress was not made in these directions. Consequently, a much larger task in agriculture remains to be accomplished during the Third Plan. More than any other factor, the success of the Third Plan will turn on the fulfilment of its agricultural targets.

Approach in the Third Plan

5. In formulating agricultural production programmes for the Third plan, the guiding consideration has been that the agricultural efforts should not be impeded in any manner for want of financial or other resources. Accordingly, finance is being provided on a scale which is considered adequate, and the further assurance is given that if, for achieving the targets of production, additional resources are found necessary, those will be provided as the Plan proceeds. Supplies of fertilisers are also to be made available on a large scale. Efforts are being made to strengthen agricultural administration in the States, and stress is being placed on the closest possible coordination between different agencies, notably, those concerned with agriculture, cooperation, community development and irrigation. Supplies of credit through cooperative agencies are being expanded, and the need for linking credit with production and marketing is emphasised. It may be stressed, however, that while these efforts should go a long way, they are not in themselves a sufficient guarantee that the agricultural objectives of the Third Plan can be realised.

6. The central task of the community development organisation and of extension workers at the block and village levels is to mobilise the rural community for intensive agricultural development, to impart a sense of urgency and direction to the work of all the agencies operating on behalf of the Government, and the ensure that the requisite supplies, services and technical assistance are available at the right time and place and in the most effective manner possible. At the same time, the Agriculture Departments must place at the disposal of the community development organisation at the block level the supplies, trained personnel and other resources needed. This means that all families in the village, specially those engaged in cultivation, must be involved in the agricultural effort through the village cooperative and the panchayat, and enabled to achieve larger results through village production plans. In view of the experience in the Second Plan, these essential conditions cannot be too greatly stressed. As the country enters upon the larger tasks of the Third Plan, there is urgent need to improve the organisation of agricultural programmes at the local level as well as at higher levels in the States and at the Centre.

7. The Third Plan provides for an outlay on production programmes in agriculture, including large and small irrigation schemes, soil conservation and cooperation, of about Rs. 1280 crores, the comparable outlay in the Second Plan being of the order of about Rs. 667 crores.

Table 3: Outlays on agricultural production

(Rs. crores)

	Second Plan	Third Plan
agricultural production	98·10	226·07
minor irrigation	94·94	176·76
soil conservation	17·61	72·73
cooperation	33·83	80·10
community development (agricultural programmes)	50·00	126·00
major and medium irrigation	372·17	599·34
total	666·65	1281·00

Besides resources provided for the Third Plan, finance from cooperative agencies will also increase substantially. Short-term and medium-term loans are expected to go up from about Rs. 200 crores and the amount outstanding on account of long-term loans from about Rs. 34 crores in the last year of the Second Plan to about Rs. 530 crores and Rs. 150 crores respectively by the end of the Third Plan.

8. Programmes and targets for agriculture embodied in the Draft Outline of the Third Plan were based on preliminary studies undertaken by State Governments and the Central Ministries concerned. These were intended to provide a basis for detailed agricultural programmes to be prepared in the light of local conditions and possibilities in districts, blocks and villages. It was suggested that with a view to securing the largest measure of local participation and, in particular, the fullest utilisation of the local manpower resources, programmes relating to agriculture, minor irrigation, soil conservation and the development of cooperation should be formulated through district and block plans. An attempt has been made in several States to draw up local plans on these lines. It has been observed, however, that plans at the local level are easier to formulate after the broad dimensions and objectives of the State plans have been established. Although in proposing targets and in evolving programmes, State Governments have taken advantage of their experience in preparing district and block agricultural plans, on the whole, the programmes and the estimates of production which now form part of the plans of States have been arrived at through studies by the Departments concerned at the State level. Their proposals have been considered in two series of discussions between the States, the Planning Commission and the Central Ministries, and care has been taken to prepare them in some detail. Nevertheless, the limitation persists that they are not yet as firmly based on area plans as had been earlier hoped for. For realising the programmes and targets accepted by States there must, therefore, be continuing emphasis on the drawing up of annual district and block agricultural plans within the general scheme of the five year programme. Without district, block and village agricultural production plans, it will be difficult to ensure the widespread cooperation and local initiative and understanding of the tasks to be accomplished which are the fundamental conditions for success in agricultural development.

Programmes for increasing Agricultural Production

9. The principal technical programmes for increasing agricultural production, around which intensive work is to be organised, are: (1) irrigation, (2) soil conservation, dry farming and land reclamation, (3) supply of fertilisers and manures, (4) seed multiplication and distribution, (5) plant protection, (6) better ploughs and improved agricultural implements, and adoption of scientific agricultural practices. In all areas, and specially in the development blocks taken up under the community development programme, these programmes will need to be implemented with

the largest measure of participation on the part of local communities and to reach as many families as possible through the village production plans. In addition, in fifteen districts, in which conditions are specially favourable on account of the availability of irrigation and assured rainfall, and the cooperative movement is fairly established, it is proposed to undertake agricultural programmes on a more intensive scale than may be generally feasible. In all areas, and more especially in these, a concentrated effort will be made to reach all farmers and to promote the adoption by them of a minimum combination of improved practices.

10. The main targets under different development programmes for agriculture are summarised below:

Table 4: Targets of agricultural programmes—Third Plan

programme	unit	target
I. irrigation :		
1. major and medium irrigation (gross)	million acres	12.8
2. minor irrigation (gross)	,,	12.8
(a) agriculture	,,	9.5
(b) community development	,,	3.3
total		25.6
II. soil conservation, land reclamation, etc.		
(a) soil conservation on agricultural lands	,,	11.0
(b) dry farming	,,	22.0
(c) land reclamation	,,	3.6
(d) reclamation of saline and alkaline lands	,,	0.2
III. additional area under improved seeds— foodgrains	,,	148.0
IV. consumption of chemical fertilisers		
(a) nitrogenous (N)	thousand tons	1000
(b) phosphatic (P_2O_5)	,,	400
(c) potassic (K_2O)	,,	200
V. organic and green manuring		
(a) urban compost	million tons	5.0
(b) rural compost	,,	150.0
(c) green manuring	million acres	41.0
VI. plant protection	,,	50.0

The targets of agricultural development agreed to in consultation with individual States are set out in Annexure I to this chapter.

Minor Irrigation

11. The gross area irrigated during the Third Plan from irrigation schemes is estimated at 25·6 million acres—12·8 million acres each from major and medium irrigation works and from minor irrigation works. Of the latter, schemes financed from provisions under the community development programme are expected to irrigate about 3·3 million acres, the rest of the irrigation being secured from schemes within the agricultural programme.

Statistics relating to land utilisation are not yet available beyond 1957-58, and it is difficult to ascertain the actual increase in net irrigated area during the first two Plans as a result of the irrigation programmes which have been carried out. Minor irrigation works include a variety of schemes, some of which stabilise existing irrigation or, as in the case of drainage schemes and embankments, improve the existing irrigation without necessarily increasing the area irrigated. Allowance has also to be made for minor irrigation schemes which go out of use on account of 'deprecition' or are replaced by irrigation from major and medium irrigation schemes. In the Draft Outline it was reckoned that at the end of the Second Plan the net irrigated area might be of the order of 70 million acres, increasing to about 90 million acres by the end of the Third Plan. Recent estimates appear to suggest lower figures, but the available data are far from satisfactory. There is considerable discrepancy between statistics of progress reported in respect of both large and small irrigation schemes, and those relating to land utilisation which become available after a lag of about three years. It is proposed to undertake a special investigation into these differences.

12. In the Third Plan the total outlay on minor irrigation from provisions under agriculture and community development is likely to be about Rs. 250 crores, in addition to such finance as cooperative agencies may provide. Thus, minor irrigation is one of the larger investment programmes in the Third Plan. The principal advantages of minor irrigation works are that they can be executed quickly, entail small outlays and there is only a short lag between their completion and the realisation of benefits. Moreover, they can be undertaken at the initiative of individuals and small groups and offer scope for participation by the community. Yet, it has been observed that minor irrigation programmes are tending increasingly to develop as programmes for small-scale irrigation works executed by Government agencies with little voluntary labour or participation by the people. It is of the utmost importance that for the greater part minor irrigation should be developed in all States as essentially a community programme in which local contributions in money and labour are specially stressed. When the scale of the minor irrigation programme becomes large, it involves problems of organisation, investigation and utilisation which may in some ways be even more difficult than those which arise in the case of larger irrigation works. In the early phases of the minor irrigation programme the simpler categories of works can be taken up and the need for extended surveys is not always felt. Preliminary studies suggest that the possibilities of minor irrigation development could extend eventually to a gross area of about 75 million acres. To realise this potential, surveys and investigations should be undertaken in every State in a systematic manner for various river basins, and there should be adequately staffed investigation units working in different areas. At present few areas have minor irrigation

projects which are worked out sufficiently in advance for implementation without delay.

13. Experience during the First and Second Plans suggests certain directions in which the implementation of the minor irrigation programme needs to be improved if full benefits by way of increase in agricultural production as well as adequate financial returns are to be realised. These relate to better maintenance, adoption of appropriate crop patterns, better utilisation and water management, and efficiency in execution. Investigations undertaken by the Committee on Plan Projects and other studies have pointed to the need for strengthening the present arrangements for the maintenance of minor irrigation works on the part of the State Governments as well as local communities, thereby reducing losses due to 'depreciation' which appear to occur at present at an alarmingly high rate. An increasing proportion of minor irrigation works now under construction are such that State Govenments should undertake responsibility for their maintenance. The technical and administrative organisation for minor irrigation works must therefore be strengthened and regular inspection and supervision assured.

It is also essential that certain obligations should be placed by law on local communities and beneficiaries. In most parts of India obligations relating to the maintenance of field channels were long in existence and were entered in revenue records. These customary obligations have, however, tended to fall into disuse, and greater definiteness has now to be given to them through legislation. Some States have already enacted such legislation. The main obligations to be undertaken relate to construction and maintenance of field channels, maintenance of bunds and tanks, and desilting of the beds of tanks where the works are not of such magnitude that they must be taken up by Government. It is envisaged that statutory powers should be conferred on village panchayats for enforcing these obligations on the part of beneficiaries. If the latter fail to carry out the works in time, the panchayat should carry them out and realise the cost. In the event of village panchayats failing to carry out the works, the Government or, on its behalf, the Panchayat Samiti of the development block may arrange for their execution, the cost being recovered eventually from beneficiaries.

14. The problem of reducing time lags between the completion of works and realisation of their benefits arises not only for large schemes but also for a large proportion of small irrigation schemes. Being widely dispersed, minor irrigation works demand in fact greater attention from the extension agencies. A recent field study of the problems of minor irrigation by the Programme Evaluation Organisation suggests that non-utilisation of facilities is a factor of quite serious dimensions even in the case of minor irrigation, and calls for close study in each area with reference to different types of works. Irrigation in any area calls for a series

of agricultural measures, including adoption of new crop patterns, land development, soil and water conservation and other improved agricultural practices. It is important that agricultural extension personnel should concentrate on these measures, so that irrigation yields the expected benefits. The methods to be adopted are well-known and the question is primarily one of advance planning and of giving continuous attention to the tasks mentioned above.

15. Execution of the minor irrigation programme has suffered to some extent because experienced personnel able to adapt their technical knowledge to different kinds of construction works have not been available in sufficient numbers. The situation has improved to some extent. However, in view of the large size of the programme to be carried out in the Third Plan, it is necessary that suitable technical cadres should now be built up in the States. This will become all the more important if a large-scale rural works programme devoted specially to agricultural development, as has been visualised, is to be successfully organised. Moreover, in several parts of the country the scope of the minor irrigation programme is itself being enlarged through the development of rural electrification. During the Second Plan, minor irrigation programmes suffered to some extent from difficulties in acquiring land, inadequate delegation of financial and administrative powers to personnel in charge of works, and failure to sanction works in advance of the construction season.

16. There are other problems of an administrative nature to which attention should be drawn. There has been a tendency for overlapping financial provision for minor irrigation schemes under agriculture and under community development. It is necessary that the financial provisions for minor irrigation schemes, whether under agriculture or community development, are pooled together at the block level and utilised for the maximum benefit of the area. It is considered that for individuals assistance for minor irrigation works should come, as far as possible, from cooperative agencies and taccavi loans and from the Agricultural Departments. Provisions available under the community development block budget should give preference to schemes benefiting large numbers of persons jointly. They may be undertaken either by village panchayats or by cooperative groups.

17. In recent years, in irrigation as in other fields of agricultural development, different kinds of subsidies have been used as a method of stimulating new activity. The general policy should be to reduce these subsidies progressively and, where possible, to eliminate them. There might be some justification for a subsidy which is intended to benefit the poorer sections of the community or to support for a limited period innovations or improved practices which have not yet been accepted. The existing schemes of subsidies should be reviewed critically

and, after examining other ways of achieving the same objects, phased programmes should be drawn up for reducing and, to the extent feasible, terminating the subsidies.

18. For the Third Plan the Central Government have sponsored two new schemes in the field of minor irrigation. A programme of applied research is to be taken up for the study of problems which arise in the execution of minor irrigation works with a view to effecting economy in construction costs, efficient operation of irrigation works and economic use of water reaching the fields. A scheme for training agricultural graduates in irrigation water use has also been formulated. These schemes will be undertaken through the agency of both Central and State institutions.

19. In some parts of the country, specially the Punjab and Uttar Pradesh, the problem of water-logging has become serious. With a view to reclaiming water-logged areas and checking deterioration. agricultural programme provide for schemes for improving surface drainage and installing shallow tubewells.

20. For several areas an extensive programme of exploratory tubewells has been in operation. Out of 379 drillings which have been attempted, as many as 195 have proved successful upto March, 1961. The successful tubewells are being taken over by the State Governments concerned. If the data are made available more widely, the construction of private and cooperative tubewells could be encouraged in the more favourable areas.

21. *Soil conservation, dry farming and land reclamation.*—Considerable emphasis is being given in the Third Plan to soil conservation and dry farming. These programmes are dealt with in the Chapter on Soil Conservation. A word may, however, be said here on land reclamation. A technical committee is at present engaged, in cooperation with States, in surveying and locating large blocks of waste lands. The committee has already completed its surveys of land classified as "other uncultivated lands excluding fallow lands" and "fallow lands other than current fallows" in seven States. In these, a total area of nearly one million acres comprising blocks of land of 250 acres or more which may be available for reclamation and resettlement has been located. Schemes for reclaiming these blocks will have to be drawn up. The area of 3.6 million acres shown as the target for land reclamation includes about 2 million acres in Rajasthan and also some other lands recommended by the technical committee. The programme for mechanised land reclamation operations will require personnel trained in the operation, maintenance and repair of tractors. In addition to the existing Tractor Training Centre at Budni (Madhya Pradesh) the Third Plan provides for the establishment of a second centre. The centre at Budni is also being developed.

22. *Fertilisers and manures.*—Supplies of fertilisers are proposed to be increased during the Third Plan in accordance with the following provisional schedule:

year	nitrogenous fertilisers (nitrogen)	phosphatic fertilisers (P_2O_5)	potassic fertilisers (K_2O)
	(thousand tons)		
1960-61	230	70	25
1961-62	400	100	82
1962-63	525	150	100
1963-64	650	225	130
1964-65	800	300	160
1965-66	1000	400	200

Programmes for indigenous production and for imports both of fertilisers and of the raw materials needed, are based on the above estimates.

23. Although there has been rapid growth in the demand for fertilisers and in recent years it has not been possible to meet the full requirements of cultivators, it will be a considerable administrative task to ensure the efficient distribution and use of increased supplies contemplated for the Third Plan. In this connection, reference may be made to the recommendations made by the Fertiliser Distribution Enquiry Committee, in particular, to the emphasis on the use of fertilisers in the form of mixtures with a view to promoting balanced fertilisation and making the best use of supplies of nitrogenous fertilisers, improved arrangements for distribution and attention to quality, and reduction in costs of distribution. As suggested by the Committee, for dealing effectively with problems arising out of increased distribution of chemical fertilisers, their storage and sales promotion, etc., a Central Fertiliser Marketing Corporation is proposed to be set up during the Third Plan period. The U.N. Fertiliser Mission which has recently studied the fertiliser problem has stressed the need for educational work with the small farmer for extensive soil tests to determine the kinds and quantities of fertilisers needed under different conditions, and for continuous research into the use of fertilisers. The availability of credit for enabling small cultivators to use fertilisers is also of the greatest importance. These considerations should be kept in view in implementing the programmes formulated by the States.

24. Despite progress in some directions, on the whole, sufficient stress is still not being laid in extension work on the development of local manurial resources, specially organic manures. Among the targets adopted by States for the Third Plan are about 5 million tons of urban compost, about 150 million tons of rural compost, and green manuring of about 41 million acres of land comparing to about 12 million acres at the end of the Second Plan. Except for the urban compost programme, which is organised through municipal committees and the larger village panchayats, fulfilment of the other targets is difficult to measure. It is

hoped that through intensive work at the block and village levels the targets for green manuring and rural compost will be further improved upon. Increasing emphasis is also proposed to be laid on utilisation of sewage. A direction in which there is need for intensive work is the production of nightsoil compost. This has been taken up on a pilot basis in several places, and it is suggested that the experience gained should now be studied with a view to formulating a larger and a more extended programme of development.

25. Some progress has been made in developing cowdung gas and manure plants suitable for use in villages. The Indian Agricultural Research Institute has designed a model of the gas plant which is being used in some villages near Delhi and elsewhere. The gas plant costs about Rs. 400 to Rs. 450, and this is a factor inhibiting its adoption on a wider scale. The more extended use of the gas plant will help increase soil fertility and crop yields besides contributing to the solution of the fuel problem.

26. Soil testing has an important contribution to make in determining the right use of fertilisers for increasing crop yields and maintaining soil fertility. In recent years a number of laboratories have been established and their studies are coordinated by the Indian Agricultural Research Institute. With the object of compiling data on soils, providing training in soil science and soil mechanics and undertaking both fundamental and applied soil research, it is proposed to set up a Central Institute of Pedology and Soil Mechanics.

27. *Seed multiplication and distribution.*—Establishment of seed farms in all development blocks to meet the requirements of foundation seed of improved varieties was one of the principal programmes undertaken in the Second Plan. In all, about 4000 seed farms are reported to have been set up and about 800 more are expected to be established in the early years of the Third Plan. At the end of the Second Plan, a large proportion of the farms established have begun to provide seed for multiplication by registered growers, and it may take two or three years more before the benefits of the programme begin to be realised on a significant scale. Although, on an average, an area of 25 acres for a seed farm was at first indicated, a fair proportion of seed farms are of larger size. At the larger farms it is easier to provide technical personnel of the requisite quality and to undertake production on a more economic basis. These considerations should be kept in view, specially in respect of seed farms which have still to be set up, and of those which, as a temporary measure, were started on leased lands. Each seed farm provides for a seed store. To ensure better distribution, in the Third Plan States have generally provided for the setting up of an additional seed store in every development block. At the end of the Second Plan, the area under food crops covered by improved seed is estimated at 55 million acres. This is expected to increase by 148 million acres in the course of the Third

Plan. While registered growers have a valuable role to play in the multiplication of improved varieties of seed, in formulating block and village agricultural plans, the aim should be to ensure that every village produces its own requirements of improved seed, undertaking as large a share of this task on a cooperative basis, but also making use of the better farmers. A field study of the multiplication and distribution programme for improved seed undertaken by the Programme Evaluation Organisation has revealed a number of weaknesses in the existing situation and in the working of seed farms. It is suggested that State Governments may review their proposals for the Third Plan in the light of these findings.

28. Considerable research has been undertaken in recent years for evolving high-yield hybrids of maize, and it has been found that with moderate amounts of nitrogenous fertilisers the yield of maize hybrids increases more than twice that of the local varieties. It is therefore proposed to take up the cultivation of hybrid maize on a countrywide scale, the first stage being to bring about 25 per cent of the maize area under hybrid varieties during the Third Plan. It is also intended to make a start with the production of hybrid jowar seed. The Ministry of Food and Agriculture propose shortly to establish a Seed Corporation with the object of ensuring production at selected farms under conditions of efficient management and maintaining purity and the maximum yield. An organisation is to be set up for the production of nucleus seed, and it is envisaged that cooperatives and other suitable organisations and, where necessary, individuals should function as certified seed agencies. Legislation for controlling the quality of seeds and regulating their production, marketing and movement is also under consideration.

29. *Plant protection.*—Over the past decade, plant protection measures have lagged behind several other aspects of the agricultural programme. In the Second Plan, the programme covered about 16 million acres of land. For the Third Plan, States have indicated a target of 50 million acres. The precise damage to crops from insects, rodent and other animal pests and on account of diseases, weeds and parasitic flowering plants. is difficult to assess, but there can be no doubt of its serious dimensions. Similarly, considerable losses are caused by the deterioration of foodgrains and other agricultural commodities during storage through insects, rats, mice, etc. Much of the damage can be prevented if plant protection measures are adopted on an adequate scale as an integral part of the agricultural programme. Plant protection organisations in several States need to be strengthened at various levels. In addition to special units which might function over larger areas, it is necessary that with a view to securing the maximum extension effect, manually operated dusters and sprayers should be supplied extensively to farmers and to village panchayats. With these it is essential to ensure the timely supply of pesticides.

30. *Improved agricultural implements.*—A serious gap in the agricultural programmes undertaken during the First and Second Plans has been in the field of improved agricultural implements. There is general recognition of the importance for scientific agriculture of improved tillage and harvesting practices, but specific action has been slow and insufficient. As has been pointed out, progress in the introduction of improved agricultural implements calls for steps at the same time in a number of directions.

31. The broad features of the programme for the adoption of improved agricultural implements proposed for the Third Plan may be briefly set out as follows:

(1) Adequate supplies of iron and steel of the categories required for agricultural implements should be made available. Precise estimates of requirements should be prepared each year in advance based on the actual programme of production and distribution which it is proposed to carry out. Requirements for manufacture of implements should be estimated separately from those for repairs and maintenance. It will be an advantage to place the supplies of iron and steel for agricultural purposes at the disposal of the Agricultural Departments in the States.

(2) The principal implements which should be recommended in each State for popularisation have been selected provisionally by groups of experts. The suggestions should be considered by States and a final selection should be made with a view to arranging for production, distribution, etc.

(3) Four regional research, testing and training centres for improved agricultural implements have been set up by the Indian Council of Agricultural Research as part of its programme in the Second Plan, and are to be transferred to the States in which they are situated. It is proposed to establish one research, testing and training centre in improved agricultural implements in every State. Research, testing and training centres should be free to undertake manufacture on a commercial scale but, in the main, they should concentrate on the production of improved proto-types and of implements which are not in the market and of components of special quality which may be used by other fabricators. As part of the intensive agricultural district programme, workshops are also being established in a number of districts. For improved implements to spread out rapidly, their production should be taken up as a development programme at the district and block level, and industrial cooperatives for the manufacture of agricultural implements should be actively supported.

(4) According to their conditions suitable extension arrangements should be made by State Governments at the district and block levels for demonstrating and popularising improved agricultural implements. It would not be possible to set up such units at the block level in all the development blocks in the country. It would, therefore, be an advantage to consider the possibility of setting up a small number of units, say four, at the district level and attach them to the district agricultural officer. These units could move between development blocks, working in each block under the direction and guidance of the Agricultural Extension Officer and the Block Development Officer. The units could provide the necessary orientation to village level workers and village artisans and could demonstrate improved implements to the cultivators. At the block headquarters there should be a stock of implements readily available for demonstration and hire. These implements could be purchased from within the block budget and additional implements could be provided by the State Agricultural Department.

(5) Steps should be taken to strengthen the agricultural engineering section of State Agricultural Departments. The financial assistance extended to States for implementing the recommendations of the Report of the Agricultural Administration Committee will also be available for strengthening agricultural engineering personnel of the State Agricultural Departments at the State level and at the district level.

(6) With due regard to the size of the programme to be undertaken each year, assured arrangements for credit for supplying improved implements should be made. Credit should be provided both through cooperative agencies and by way of taccavi loans. Plans for co-operative development drawn up so far do not provide sufficiently for credit for agricultural implements, and this aspect should receive special attention.

(7) Agricultural workshops have been established at 25 extension training centres. It is proposed that all extension training centres should now be equipped with agricultural workshops for providing training facilities for village level workers, mechanics and artisans.

(8) At the State level, there may be a Committee or a Board, including representatives from amongst farmers and manufacturers and others, for assisting in drawing up production programmes and devising suitable arrangements for distribution and ensuring supplies of raw materials.

With expansion in the agricultural implements programme, there will be need for considerably larger numbers of agricultural engineers than

the existing training facilities are likely to make available. This aspect has been taken into account in formulating the programme of technical education. The total provision in the Third Plan for the programme of agricultural implements is about Rs. 8 crores.

32. *Intensive agricultural district programme.*—In recommending the selection of certain areas for more intensive efforts, the Agricultural Production Team sponsored by the Ford Foundation observed that there were no inherent soil, climatic or other physical reasons for the present low yields. The Team, therefore, suggested that those selected crops and those selected areas in each State should be chosen which have the greatest increase potentialities. In pursuance of this proposal, the intensive agricultural district programme has been taken up, to begin with, in one district in each State. The programme is intended to contribute both to rapid increase in agricultural production in the selected areas and to suggest new innovations and combinations of practices which may be of special value elsewhere. In the selected districts an attempt will be made to provide all the essential elements for increasing production to the extent needed, such as, supplies of fertilisers, pesticides and improved seeds and improved implements, and composite scientific demonstrations will be laid out on a large scale. An effort will be made to provide credit on a scale sufficient to reach all farmers, including those previously considered uncreditworthy and credit and marketing will be linked. Extension personnel, specially in agriculture and cooperation, are being made available on a somewhat larger scale than in other areas so that they can work intensively with Panchayat Samitis and Village Panchayats and with co-operative organisations. Through benchmark surveys and systematic evaluation, high standards of performance will be insisted upon in these districts. The districts chosen for intensive development should give to the agricultural and other services in each State special opportunities for developing improved methods for extension and for planning of agricultural production at the block and village levels as well as in relation to the individual farmer.

ESTIMATES OF PRODUCTION IN THE THIRD PLAN

33. The development programmes which have been described above constitute the essential targets of the Third Plan. However, for various purposes, it is useful to estimate additions to production likely to be achieved on the assumption that the various development programmes are carried out and, along with these, improved agricultural practices are adopted on the scale contemplated. Although efforts have been made in recent years to base 'yardsticks' of additional production on precise experimental data, the measures adopted must be regarded at best as rough guides rather than as a satisfactory basis for firm targets. Moreover, in agriculture weather conditions are always dominant element. These limitations

should be kept in view in comparing the following estimates of production which may be realised by the end of the Third Plan.

Table 5: Estimates of production in the Third Plan

commodity	unit	base level production 1960-61	target of additional production 1961-66	estimated production in 1965-66	percentage increase
foodgrains	million tons	76·0	24.0	100·0**	31.6
oilseeds	,,	7·1	2·7	9·8	38·0
sugarcane (gur). . .	,,	8·0	2·0	10·0	25·0
cotton	million bales	5·1	1·9	7·0	37·2
jute	,,	4·0	2·2	6·2*	55·0
coconut	million nuts	4500	775	5275	17·2
arecanut	thousand tons	93	7	100	7·5
cashewnut. . . .	,,	73	77	150	105·5
pepper	,,	26	1	27	3·9
cardamom.	,,	2·26	0·36	2 62	15·9
lac	,,	50	12	62	24·0
tobacco	,,	300	25	325	8·3
tea	million lbs.	725	175	900	24·1
coffee	thousand tons	48	32	80	67·7
rubber	,,	26·4	18·6	45	70·5

Estimates of increase in production of major crops in different States are set out in a series of statements in Annexure II to this chapter.

34. According to the estimates of increased production the index of agricultural production (base—1949-50) should rise from 135 in 1960-61 to 176 in 1965-66, the total increase being about 30 per cent over the five year period. Increased production of the order envisaged above can take place only on the assumption that the various development programmes will be carried out effectively and with widespread public participation and use of local manpower and other resources and that intensive efforts will be made in every block to adopt improved agricultural practices.

*Excludes mesta which may provide an additional 1.3 million bales in the Third Plan.

**It is estimated that the production of rice in 1965-66 may be about 45 million tons. of wheat about 15 million tons, of other cereals about 23 million tons and of pulses about 17 million tons.

The following Table compares the average yield in lb. per acre during the period of the Second Plan and that anticipated for the Third Plan:

Table 6: Average production and yield per acre in the Second and Third Plans

crop	average annual production (mn.tons)		average yield (lb. per acre)		percentage increase during Third Plan over Second Plan	
	1956-57 to 1960-61	1961-62 to 1965-66	1956-57 to 1960-61	1961-62 to 1965-66	production	yield
foodgrains . .	70·9	86·8	575	670	22·4	16·5
(i) rice . .	29·3	39·4	807	1029	34·4	27·5
(ii) wheat .	9·3	12·1	662	795	30·1	20·1
oilseeds . .	6·5	8·6	451	500	32·3	10·9
sugarcane (gur)	7·3	9·3	3206	3788	27·4	18·2
cotton (million bales)	4·6	6·1	95	108	32·6	13·7
jute. (")	4·4	5·1	1035	1200	15·9	15·9

The greater part of increase in yields will necessarily have to be secured in areas under irrigation and assured rainfall, but even in other areas through soil conservation and dry farming there should be some improvement in yields.

35. The estimates of production for the Third Plan given in table 5 represent an appreciable increase in per capita availability. In foodgrains, the availability per capita is expected to increase from 16 oz in 1960-61 to 17.5 oz per day in 1965-66 and consumption of cloth from about 15.5 yards to 17.2 yards per year. Consumption of edible oil is expected to go up from 0.4 oz to 0.5 oz per day over the Third Plan period.

36. A preliminary assessment of the likely changes in the Third Plan in the pattern of land utilisation suggests that the net area sown may increase from about 327 to 335 million acres and area sown more than once from about 52 to 67 million acres. The area of culturable waste is expected to diminish from about 47 to 41 million acres.

OTHER ASPECTS OF THE AGRICULTURAL PROGRAMME

37. *Commercial crops.*—Except for sugarcane, the targets set for commercial crops in the Second Plan have fallen short to a considerable extent. Therefore, in the Third Plan it is essential to intensify efforts for increasing the production of these crops, specially, cotton, jute and oilseeds. Over and above the provision for programmes like minor irrigation, seed farms and plant protection which will benefit all crops, outlays to the extent of about Rs. 26 crores have been provided for special development schemes relating to different commercial crops. As the Plan proceeds, it might be necessary to make larger resources available for special development schemes of commercial crops. Special care will be taken to ensure

adequate supplies of fertilisers for these crops. It might also be necessa to facilitate diversion of areas from millets to commercial crops. The aim is not only to attain higher levels of production, but also to secure larger supplies of varieties which have considerable export demand or which will save on imports.

38. Detailed programmes relating to different commercial crops have been worked out by various commodity committees. In the main, these involve expansion and intensification of programmes already adopted during the Second Plan. Some features of these programmes, on which special stress is being laid in the Third Plan, may be briefly mentioned.

It is proposed to provide necessary support for increasing the production of cotton and specially of long-staple varieties of cotton, such as, sea-island cotton in Mysore and Kerala and hybrid cotton in Gujarat and Maharashtra. The cultivation of sea-island cotton is to be extended from about 20,000 acres at present to about 300,000 acres at the end of the Third Plan.

Programmes for jute development are directed, in particular, towards improvement in quality through the provision of retting tanks and of high quality seeds. Greater attention will be given to the development of supplementary fibres, such as, mesta, sisal, ramie, etc.

Increase in the production of oilseeds is one of the critical targets in the Third Plan both to meet higher domestic demands and to provide surpluses for export. To increase the availability of vegetable oils for exports, it is proposed that in the course of the Third Plan at least about one-half of the cotton seed available should be utilised for extracting oil, and solvent extraction of expeller oilcakes should be substantially increased. Greater attention will also be given to problems connected with the development of non-edible oilseeds like *mahuva* and neem as also rice bran, etc.

The Ministry of Food and Agriculture propose to set up a Spices and Cashewnut Committee for undertaking research and guiding development in these crops. The programme for cashewnut development involves bringing under cultivation an additional area of about 300,000 acres.

In tobacco the main problem is to produce varieties for which there is demand abroad. Greater attention will, therefore, be given to the improvement of Virginia and other types of tobacco by ensuring supply of pure seed, provision of the types of fertiliser required, careful handling of leaves and better arrangements for curing. The increase in production during the Third Plan from 300,000 to 325,000 tons is intended almost entirely for the production of Virginia tobacco.

39. *Tea, coffee and rubber.*—Plantation crops, specially, tea, coffee and rubber, have been assigned high priority in the Third Plan. The Plan envisages increase in the export of tea from 465 to 550 million lbs. and more than twofold increase in exports of coffee from the present level of 340,000 cwt. The consumption of rubber has increased rapidly in recent years and is now estimated at 53,000 tons. Requirements by the end of the Third Plan are estimated at about 100,000 tons. In the course of the Third Plan it is proposed to increase the production of natural rubber from about 26,000 to 45,000 tons and also to produce about 15,000 tons of reclaimed rubber and 50,000 tons of synthetic rubber. Supplies of fertilisers on an adequate scale will be provided for all plantation crops. To facilitate replanting programmes arrangements are also being made to provide the necessary finance.

40. *Horticulture.*—A number of new schemes were introduced during the Second Plan for the development of fruit production. These include provision of financial assistance for planting new orchards and rejuvenating old ones, as well as facilities for training gardeners. During the Second Plan about 166,000 acres of new orchards were planted and about 132,000 acres of old orchards were rejuvenated, and over 4,000 gardeners were trained. The total area at present under fruits and vegetables is estimated to be about 6 million acres, of which nearly one-half is under fruit cultivation. In the Third Plan, the total area under fruits and vegetables is expected to increase to about 7 million acres. It is proposed to bring 235,000 acres under new orchards and to rejuvenate 250,000 acres under old orchards. Besides continuing schemes already in operation, the plans of States provide for the establishment of progeny orchards with nurseries and garden colonies. The nurseries will help in the supply of planting material of reliable parentage and guaranteed performance.

For the development of vegetable production, the plans of States provide for supply of improved varieties of seeds, plant protection measures and technical advice. Arrangements are also being made for certification of vegetable seeds.

Development of fruit and vegetable preservation has been assisted for some years past through subsidy on tinplate for fruit and vegetable products, rebate of excise duty on sugar used for exported products, and provision of training facilities, technical advice and development loans. The output of fruit and vegetable products increased from about 20,000 tons at the end of the First Plan to about 40,000 tons in 1960-61 and is expected to rise to about 100,000 tons by the end of the Third Plan.

41. *Subsidiary foods.*—Subsidiary foods include primarily potatoes, sweet potatoes and tapioca and other vegetables and fruits and certain

processed and derived fruits. The Third Plan includes programmes for the increased production of these articles. Their greater use is intended to help diversify the pattern of food consumption and promote balanced nutrition. The Plan also includes development schemes for the conservation and effective utilisation of perishable foodstuffs through refrigerated transport, establishment of dehyderation units, cold storage and development of protein rich foods.

42. *Agricultural marketing.*—The total number of markets in the country is about 2500. The number of regulated markets increased from about 470 at the end of the First Plan to 725 at the end of the Second Plan. In the course of the Third Plan it is proposed to bring the remaining markets within the scheme of regulation. The programme for grading commodities under the Agricultural Produce (Grading and Marketing) Act is also being expanded.

The market intelligence service now covers about 500 markets. In the Third Plan it is proposed to extend further the number of reporting centres so as to provide adequate coverage for all areas in the country and strengthen the dissemination of market news.

An increasingly important aspect of agricultural marketing is the development of co-operative marketing organisations at various levels. Programmes for the expansion of co-operative marketing have been described in an earlier chapter.

43. *Storage.*—Programmes for the expansion of storage capacity with the Government, warehousing corporations and various co-operative organisations were initiated during the Second Plan. The Central Government has at present a total storage capacity of about 2·5 million tons, of which about a third is owned by Government. It is proposed to increase this to about 5 million tons, of which about 3·5 million tons will be owned by Government. The warehouses of the Central and State warehousing corporations have a storage capacity of about 350,000 tons; this is to be increased to over 1·6 million tons. In addition, the capacity of the godowns of co-operative marketing societies and primary societies is expected to go up from about 800,000 tons to about 2 million tons. The Plan has allotted Rs. 25 crores for the construction of additional godowns by the Government for the storage of foodgrains and Rs. 8 crores for warehousing programmes. The provision of storage capacity is a vital step in the implementation of price policies under the Plan and such further resources as may be needed will be made available.

44. *Agricultural education.*—Proposals in the Third Plan relating to the expansion of agricultural education and research are discussed in

the Chapters on Technical Education and Scientific and Technological Research. In the course of the Third Plan, the number of agricultural colleges will increase from 53 to 57 and the annual intake will go up from 5600 to 6200. The total requirements of agricultural graduates for the Plan period are estimated at about 20,000 and these are expected to be met.

45. During the Second Plan, an agricultural university was established at Pantnagar (Rudrapur) in Uttar Pradesh. Further proposals for setting up agricultural universities are under examination. The view that agricultural universities have a special contribution to make towards the development of agriculture has been urged in a series of expert reports on agricultural education. It is pointed out that if India's agriculture is to be raised to levels comparable with those of advanced countries, agricultural education of the traditional type, which is not sufficiently linked with research and extension will not be adequate in relation to the complex and changing problems of the vast body of cultivators, most of them operating very small holdings. The agricultural university seeks to bring together a number of related fields of study, such as, agriculture, animal husbandry, veterinary science, dairying, basic sciences and humanities. The underlying concept is that the responsibility of the agricultural university extends beyond teaching to applied as well as fundamental research in agriculture and involves special obligations towards cultivators in the area served by the university, in particular, to discuss their problems by working with them, transmit the results of research, and bring teaching, research and extension into an integrated view of agriculture and agricultural education.

46. *Agricultural research.*—The Plan provides for an outlay of about Rs. 28 crores for agricultural research—about Rs. 11 crores at the Centre and Rs. 17 crores in the States. In the past, agricultural research tended to be confined mainly to government farms and research stations and its results did not reach cultivators to any great extent. Extension activities have brought research workers into closer contact with farmers and presented them with new problems. Research organisations in the States are being strengthened for dealing with these problems. For crops like wheat, rice, millets, cotton and oilseeds, it is proposed to develop research facilities on a regional basis in addition to work undertaken in the States. The Plan provides for intensive study of irrigation practices in river valley projects and for working out the water requirements of crops, new crop rotations, and problems connected with the use of fertilisers in irrigated areas. Among the new centres of research to be established in the Third Plan are an institute for soil science and pedology, a forage and grasslands research institute and virus research institute.

47. *Agricultural administration.*—In view of the large programmes of agricultural development, the need for strengthening Agricultural Departments in the States has been felt for several years. To this end a series of proposals were made three years ago by the Agricultural Administration Committee. These include strengthening of staff at various levels, revision of terms and conditions, and expansion of facilities for training, education and research. To a considerable extent, the plans of States incorporate schemes for strengthening Agricultural Departments which have been worked out in the light of the recommendations made by the Committee. However, there has been some delay in implementing proposals for strengthening State agricultural administration. It is, therefore, suggested that these should be given effect to as a matter of first priority.

48. *State farms.*—A Central mechanised farm with an area of about 30,000 acres was established in 1956 at Suratgarh in Rajasthan. The possibility of establishing more State farms on similar lines has been studied and it is proposed to set up one and possibly two more farms during the Third Plan.

49. *Agricultural price policy.*—For achieving the high targets of agricultural production set for the Third Plan, it is important that growers should have full confidence that the additional effort and investment which are called for will yield adequate return. Changes in the prices and production of fibres during the last few years show that wide fluctuations in prices affect the growers' capacity to make sustained efforts for increasing production. The fall in prices of jute in 1958 affected production in subsequent years. The assurance of minimum remunerative prices for important cereals and cash crops like cotton, oilseeds and jute over the period of the Plan will provide the necessary incentives for increasing production, thus adding to the effectiveness of the various development programmes provided for in the Third Plan. With this object in view, decisions regarding the prices at which Government should buy and sell, should be taken sufficiently in advance of the sowing season. Where floor and ceiling prices are fixed, they should be related to the requirements of production, and the range between the minimum and maximum prices should not be too wide.

50. Cooperative marketing societies are an important means for imparting a certain degree of staying power to the growers, particularly in relation to adverse seasonal fluctuations in prices. Cooperative and State agencies for the purchase and sale of the principal agricultural commodities at appropriate stages are, therefore, a key element in the organisation needed to achieve the agricultural goals as well as the objectives of price policy set by the Third Plan.

ANNEXURE I

I.1. Gross area benefited by major and minor irrigation during Third Plan

(thousand acres)

State/Union Territory	major irrigation	minor irrigation		
		total	agricultural sector	c.d. sector
1	2	3	4	5
Andhra Pradesh	1557	1427	1177	250
Assam	79	370	220	150
Bihar	2000	1064	564	500
Gujarat	864	1190	1050	140
Maharashtra	708	1210	1136	74
Kerala	255	.56	192	64
Madhya Pradesh	850	711	536	175
Madras	241	578	524	54
Mysore	876	182	142	40
Orissa	946	270	120	150
Punjab	1301	1029	763	266
Rajasthan	1145	479	339	140
Uttar Pradesh	1042	2945	1812	1133
West Bengal	884	904	812	92
Jammu and Kashmir	38	54	29	25
Delhi	..	7	6	1
Himachal Pradesh	..	36	25	11
Manipur	..	15	14	1
Tripura	..	20	12	8
N.E.F.A.	..	7	5	2
total	12786	12754	9478	3276

I.2. Area benefited by soil conservation and land development during Third Plan

(thousand acres)

State/Union Territory	soil conservation on agricultural lands	dry farming	land reclamation	reclamation of saline and alkaline lands
1	2	3	4	5
Andhra Pradesh . . .	550	2000	220	..
Assam	29	1	18	..
Bihar	288	10	75	..
Gujarat	1179	1200	12	45
Maharashtra . . .	5000	3160	24	37
Kerala	70	..	..	..
Madhya Pradesh . . .	1392	4500	260	..
Madras	340	400	225	1
Mysore	270	540	22	38
Orissa	300	500	..	8
Punjab . . .	46	500	240	50
Rajasthan	178	4850	2000	10
Uttar Pradesh . . .	1067	4004	10	10
West Bengal . . .	114	100	432	..
Jammu and Kashmir . . .	7	..	20	..
Delhi	..	5	..	4
Himachal Pradesh . . .	18	20	..	..
total . . .	10848	21790	3567	203

1.3. Area under food crops to be covered with improved seeds during Third Plan

(thousand acres)

State/Union Territory	1960-61	1965-66
1	2	3
Andhra Pradesh	1230	12780
Assam	438	3000
Bihar	2618	11800
Gujarat	747	3025
Maharashtra	2931	14538
Kerala	500	1200
Madhya Pradesh	6300	15298
Madras	7250	9450
Mysore	4869	8876
Orissa	1200	6200
Punjab	3000	9000
Rajasthan	4140	17000
Uttar Pradesh	18961	29301
West Bengal	1000	6000
Jammu and Kashmir	147	240
Delhi	1	1
Himachal Pradesh	107	395
Manipur	..	140
Pondicherry	2	9
total	55441	148253

I.4. Consumption of chemical fertilisers during Third Plan

(thousand tons)

State/Union Territory	ammonium sulphate		superphosphate		muriate of potash	
	1960-61	1965-66	1960-61	1965-66	1960-61	1965-66
1	2	3	4	5	6	7
Andhra Pradesh	273	524	90	350	..	..
Assam .	10	60	5	25	..	..
Bihar .	50	400	15	120	1	20
Gujarat .	95	300	48	90	..	13
Maharashtra .	100	581	53	324	..	
Kerala .	37	191	7	190	1	56
Madhya Pradesh	26	200	5	40	..	..
Madras .	150	580	60	320	12	90
Mysore .	87	300	20	320	..	11
Orissa .	30	200	8	50	..	2
Punjab .	40	280	2	24	..	..
Rajasthan .	15	100	4	33	..	..
Uttar Pradesh	297	990	60	300	8	80
West Bengal .	40	500	25	250	..	..
Jammu and Kashmir	4	14	..	..	..	.
Delhi .	1	1	..	..	..	.
Himachal Pradesh	..	1	..	1	.	.
Pondicherry .	25	25	2	5	1	6
total	1280	5247	404	2442	23	278*

* In terms of K2O the consumption target should be 144,000 tons. The lower figure as compared to that given in paragraphs 10 and 22 is due to the fact that it does not take into account the consumption figures of other States for which information is not available.

1.5. Estimates for organic manures and green manuring during Third Plan

State/Union Territory	urban compost		rural compost		green manuring	
	1960-61	1965-66	1960-61	1965-66	1960-61	1965-66
	(000 tons)		(000 tons)		(000 acres)	
1	2	3	4	5	6	7
Andhra Pradesh	262	334	9439	12874	3200	4500
Assam	8	16	800	900	200	1000
Bihar	75	177	1000	7756	1095	3095
Gujarat	118	318	246	371	10	100
Maharashtra	342	447	459	1055	22	1022
Kerala	22	55	94	269	250	1050
Madhya Pradesh	160	365	130	1960	50	2200
Madras	400	600	1400	3000	3,000	6000
Mysore	310	425	3000	5380	500	750
Orissa	20	44	2340	13956	1200	7000
Punjab	200	400	6100	8900	350	1350
Rajasthan	444	968	887	269	130	630
Uttar Pradesh	580	750	56060	82340	650	9000
West Bengal	40	100	500	7500	1000	3000
Jammu and Kashmir	..	15	75	100	..	10
Delhi	5	40	..	..	2	30
Himachal Pradesh	..	..	120	220	28	78
Manipur	..	..	20	35	..	3
Tripura	1	2	67	148	..	..
total	2987	5056	82737	148033	11687	40818

ANNEXURE II

Estimates of increase in agricultural production during Third Plan

II·1. Foodgrains

(lakh tons)

State	1955-56	1958-59 (revised estimates)	1959-60 (final estimates)	1960-61 (anticipated)	additional production in Third Plan	estimated production at the end of Third Plan	percentage increase during Third Plan
1	2	3	4	5	6	7	8
Andhra Pradesh	55·36	63·64	62·96	63·95	24·04	87·69	37·6
Assam	17·06	16·60	16·60	17·69	4·20	21·89	23·7
Bihar	51·84	68·76	59·39	62·62	20·27	82·89	32·4
Gujarat }	72·55	89·28	75·07	21·16	8·31	29·47	39·3
Maharashtra }				62·66	17·32	79·98	27·
Kerala	8·87	9·65	10·55	10·42	4·00	14·42	38·4
Madhya Pradesh	76·17	92·85	90·31	90·74	16·68	107·42	18·4
Madras	45·38	49·25	50·96	51·72	16·54	68·26	32·0
Mysore	37·83	37·17	36·27	38·50	10·04	48·54	26·1
Orissa	24·63	24·52	24·47	40·00	16·15	56·15	46·5
Punjab	47·85	60·78	53·67	60·00	18·50	78 50	30·8
Rajasthan	41·75	50·93	47·26	50·35	16·00	66·35	31·8
Uttar Pradesh	118·86	133·99	131·82	135·39	47·45	182·84	35·1
West Bengal	49·73	45·26	46·15	52·24	14·49	66·73	27·8
Jammu and Kashmir	4·74	5·49	4·87	4·83	1·00	5·83	20·5
Union territories	5·32	6·86	7·15	7·15	1·05	8·20	14·7
total	657·94	755·03	717·50	769·42	236·05	1005·47	31·6

Estimates of increase in agricultural production during Third Plan

II. 4. Oilseeds

(thousand tons)

State	1955-56	1958-59 (revised estimates)	1959-60 (final estimates)	1960-61 (anticipated)	additional production in Third Plan	estimated production at the end of Third Plan	percentage increase during Third Plan
1	2	3	4	5	6	7	8
Andhra Pradesh .	1188	1109	1080	1079	558	1637	51·7
Assam . .	56	66	44	60	20	80	33·3
Bihar . . .	56	78	66	60	66	126	110·0
Gujarat }	1202	1925	1588	1050	300	1350	28·6
Maharshtra }	..	..	..	718	321	1039	44·7
Kerala . .	20	22	17	20	31	51	155·0
Madhya Pradesh	454	621	473	561	125	686	22·3
Madras . .	870	939	945	1050	290	1340	27·6
Mysore . .	503	574	580	700	175	875	25·0
Orissa . . .	65	54	54	90	110	200	122·2
Punjab. . .	149	186	165	185	115	300	62·2
Rajasthan . .	252	268	198	276	110	386	40·0
Uttar Pradesh .	765	996	1089	1180	495	1675	41·9
West Bengal .	49	55	39	40	20	60	52·0
Jammu and Kashmir	19	11	11	11	..	11	..
Union Territories .	4	3	3	4	..	4	..
total .	5643	6907	6352	7084	2736	9820	38·6

II·5. Jute (thousand bales)

State	1955-56	1958-59 (revised estimates)	1959-60 (final estimates)	1960-61 (anticipated)	additional production in Third Plan	estimated production at the end of Third Plan	percentage increase during Third Plan
Assam. . .	1212	989	1114	813	400	1213	49·2
Bihar . . .	589	1243	957	839	441	1280	52·6
Orissa . . .	245	177	212	261	400	661	153·3
Uttar Pradesh .	89	95	92	89	30	119	33·7
West Bengal . .	2013	2596	2170	1987	840	2827	42·3
Tripura .	50	58	60	41	40	81	97·6
total . . .	4198	5158	4605	4030	2151	6181	53·4

Estimates of increase in agricultural production during Third Plan

II·2 Cotton

(thousand bales)

State	1955-56	1958-59 (revised estimates)	1959-60 (final estimates)	1960-61 (anticipated)	additional production in Third Plan	estimated production at the end of Third Plan	percentage increase during Third Plan
1	2	3	4	5	6	7	8
Andhra Pradesh	128	116	115	115	60	175	52·2
Assam	9	6	9	9	5	14	55·6
Bihar	2	1	1	6	..	6	..
Gujarat }	1921	2481	1533	1106	294	1400	26·6
Maharashtra }				1207	328	1535	27·2
Kerala	10	8	8	5	100	105	..
Madhya Pradesh	403	380	279	567	184	751	32·5
Madras	335	356	401	420	100	520	23·8
Mysore	363	441	465	500	250	750	50·0
Orissa	2	2	2	2	98	100	..
Punjab	605	711	800	900	300	1200	33·3
Rajasthan	184	145	148	200	152	352	76·0
Uttar Pradesh	29	34	67	54	96	150	177·8
Union Territories	7	5	7	7	..	7	..
total	3998	4686	3835	5098	1967	7065	38·6

II.3. Sugarcane (gur)

(thousand tons)

State	1955-56	1958-59	1959-60	1960-61	additional production	estimated production	percentage increase
Andhra Pradesh	517	661	627	627	123	750	19·6
Assam	66	97	97	100	20	120	20·0
Bihar	292	606	653	685	45	730	6·6
Gujarat }	553	800	927	98	31	129	31·6
Maharashtra }	..	..		880	300	1180	34·1
Kerala	33	35	36	37	30	67	81·0
Madhya Pradesh	115	89	106	163	97	260	59·4
Madras	335	384	409	400	101	501	25·3
Mysore	290	392	384	413	97	510	23·5
Orissa	92	73	73	100	130	230	130·0
Punjab	556	725	857	780	120	900	15·4
Rajasthan	45	42	60	90	90	180	100·0
Uttar Pradesh	2940	3076	3203	3500	700	4200	20·0
West Bengal	131	117	128	128	59	187	46·1
Jammu and Kashmir	1	1	1	1	..	1	..
Union Territories	13	15	18	18	..	18	..
total	5979	7113	7579	8020	1943	9963	24·2

Rs. 450,000 was allotted. After a period, which extended from one to two years, a proportion of the national extension projects were taken up under the community development scheme for which the budget allotment was Rs. 15 lakhs. In this way the national extension and community development aspects were regarded as related phases of the same programme. The review undertaken in 1957 by the Study Team set up by the Committee on Plan Projects, led to the adoption of a single scheme of community development which was spread over two stages, each of five years. The first stage envisages a block budget of Rs. 12 lakhs, and the second of Rs. 5 lakhs. With these changes it was also decided to extend the period for covering the entire rural area by three years, from October, 1960, to October, 1963.

4. The second major development concerns the introduction of Panchayati Raj. For many years, the establishment of democratic institutions at the district and block levels, in addition to panchayats at the village level, was felt to be an essential and inevitable step if rural development was to proceed not only rapidly but largely on the basis of local effort and resources. This approach was broadly indicated in the First Plan. The Second Plan clearly visualised a well organised democratic structure of administration within the district in which the village panchayat would be organically linked with popular organisations at higher levels. Pending further study, the Plan offered interim proposals for setting up district development councils and also development committees in the blocks. The recommendations of the Study Team set up by the Committee on Plan Projects in favour of a system of 'democratic decentralisation' were considered by the National Development Council in January, 1958. The Council emphasised that the foundation of any democratic structure had to be democracy in the village. The two institutions which made effective village democracy possible were the village panchayat and the village cooperative. The first step in any area should, therefore, be to establish the network of institutions needed at the village level. Democratic institutions at the district, block and village levels should be viewed as parts of one connected structure of development administration within the district. The Council, therefore, affirmed the objective of introducing democratic institutions at the district and block levels and suggested that each State should work out the structure which suited its conditions best. During the past three years, legislation for the introduction of Panchayati Raj has been enacted in Andhra Pradesh, Assam, Madras, Mysore, Orissa, Punjab and Rajasthan. In Madhya Pradesh and Uttar Pradesh legislation has been passed by the State Legislatures. In Bihar legislation is under consideration, and in Maharashtra and Gujarat proposals have been drawn up by special committees and their reports are being considered. These developments are the fruition of the general approach

CHAPTER XX

COMMUNITY DEVELOPMENT

INTRODUCTION

WHEN the first set of community projects were taken up nearly nine years ago, community development was described as the method and rural extension as the agency through which the transformation of the social and economic life of villages was to be initiated. During the intervening years the tasks to be accomplished by the community development movement and the national priorities to be realised through it have come to be more precisely defined. At the same time, the concept of rural extension has broadened into that of Panchayati Raj, that is to say, the development of a set of interconnected democratic and popular institutions at the village, block and district levels in which the representatives of the people in the Village Panchayats, Panchayat Samitis and Zila Parishads and cooperative organisations function with the support and assistance of the various development agencies of Government working together as a team. One of the principal tasks in the Third Plan will be to ensure the growth and working of Panchayati Raj institutions so as to enable each area to realise its maximum development potential on the basis of local manpower and other resources, cooperative self-help and community effort, and effective use of the available resources and personnel.

REVIEW OF DEVELOPMENT

2. The community development programme now serves over 3,100 development blocks comprising about 370,000 villages. Of these, about 880 blocks have completed more than five years and entered the second stage of the community development programme. By October, 1963, the programme will extend over the entire rural area of the country. The total outlay on community development in the first two Plans has been about Rs. 240 crores. The Third Plan provides for a total outlay of Rs. 294 crores, in addition to about Rs. 28 crores for Panchayats.

3. In the course of the Second Plan, three important developments occurred in the community development programme. At the beginning of the Plan, work had been taken up in 950 development blocks of which about 370 were under the community projects scheme and about 580 under the national extension scheme. In the scheme of organisation prevailing at the time, every block was first taken up in the national extension service scheme, for which a programme budget of

(iii) works undertaken by the local community or beneficiaries in accordance with the obligations laid down by law;

(iv) works involving unskilled and semi-skilled labour undertaken in the block; and

(v) other activities undertaken in the block or by the block organisation with a view to securing greater contribution from local communities in respect of development schemes in different fields.

7. The three aspects described above, namely, the extension functions of the community development organisation, introduction of democratic institutions, and the preparation and implementation of area and village plans, are closely related. For carrying out extension activities, each development block has a body of village level workers and a team of technical specialists in agriculture, animal husbandry, cooperation, rural industries and other fields functioning together under the leadership of the Block Development Officer. Supported and guided by senior specialists at the district level, these extension cadres serve the Panchayat Samitis in the block and Panchayats and Gram Sabhas in the villages. They have to assist the elected representatives in preparing and implementing technically sound block and village plans on the basis of the widest possible participation on the part of local communities and the maximum use of local manpower and other resources.

Agricultural Extension

8. The principal extension functions entrusted to the community development organisation fall within the fields of agriculture, animal husbandry, cooperation and rural industries. It is to these that village level workers are expected to devote the bulk of their time and energy. In the Third Plan, the tasks to be accomplished in the fields of agriculture and cooperation are of formidable dimension. Agricultural production has to be raised by about 30 per cent, and large programmes of minor irrigation, utilisation of irrigation from both large and small irrigation schemes, soil conservation and dry farming, application of fertilisers and development of local manurial resources have to be carried out in the blocks. The programme for cooperation envisages a threefold increase in agricultural credit through cooperative agencies. Increase in agricultural production can only be achieved with the most intensive effort that can be organised at the village level. Increase in cooperative credit also demands the strengthening of the cooperative movement at the base, bringing all families in the village into the cooperative, and ensuring that credit is linked both with production and with marketing. Thus, the basic problem in the rebuilding of the rural economy at present is the organisation of the agricultural effort at the village level. In the measure in

which has been regarded for the past ten years as basic to rural development under democratic conditions and constitute a most significant step forward.

5. A third aspect of community development work which has assumed considerable importance is the proposal that, along with the district, the block should serve as a unit of planning and development. It was suggested that in the following fields proposals for the Third Plan should be drawn up by States on the basis of district and block plans:

(1) agriculture, including minor irrigation, soil conservation, village forests, animal husbandry, dairying, etc.;

(2) development of cooperatives;

(3) village industries;

(4) elementary education, specially provision of school buildings for local communities;

(5) rural water supply and the programme of minimum rural amenities, including construction of approach roads linking each village to the nearest road or rail-head; and

(6) works programmes for the fuller utilisation of manpower resources in rural areas.

Although efforts were made in several States to prepare block plans specially in agriculture, in the main, the plans of States have been prepared independently of local plans. The inference to be drawn from this is that much more effort will be needed before local plans can become a distinctive stage in the initial preparation of a Five Year Plan. In the present context of the Third Plan as formulated, what is important is that local plans should be worked out as a means for the more effective implementation of the State Plan.

6. Within the general framework of the district plan, the block plan is intended to include all social and economic activities undertaken within the block which call for (a) planning initiated locally at the block and village levels, and (b) coordination with the plans of various Departments which are implemented within the block. The following are the principal types of activities which will fall within the block plan:

(i) items in the schematic budget of the community development block according to the stage reached;

(ii) items included in the budgets of different Departments which can be executed through the block organisation;

(x) programme for the development of poultry, fish and dairy products;

(xi) animal husbandry, e.g. maintenance of stud bulls and castration of scrub bulls, etc.; and

(xii) programme for the development of the village fuel plantations and pastures.

10. The village production plan includes two main groups of programmes, namely; (a) supply of credit, fertilisers, improved seed, assistance for plant protection, minor irrigation, etc. for which a measure of assistance has to come from outside the village, and (b) programmes such as the digging of field channels for utilising irrigation from large projects, maintenance of bunds and field channels, contour bunding, digging and maintenance of village tanks, development and utilisation of local manurial resources, village fuel plantations. etc. which call for effort on the part of the village community or the beneficiaries. The success of the village production plan will largely depend on the efficient organisation of supplies, credit, etc. and the quality of the technical advice given by extension workers. In the measure in which these services are provided, there will be greater enthusiasm and cooperation from the village community in the second group of programmes mentioned above. In June, 1960, the Ministry of Community Development and Cooperation forwarded proposals to State Governments on these lines, and a number of States have since issued similar instructions. It cannot, however, be said that village production plans are yet established as a normal method of work in agricultural development or that the various practical problems involved have been resolved. In the field of extension, by far the most important task to be undertaken in pursuance of the Third Plan is to give effect to the idea of working out village production plans so as to draw all the cultivators into the common effort and, at the same time, to make available to individual farmers in an efficient and organised manner the credit, supplies and other assistance needed. The Third Plan devotes considerable resources to minor irrigation and soil conservation, supplies of fertilisers on a large scale have been assured, and resources have been provided for plant protection, improved agricultural implements and other schemes. The programme for setting up seed farms is in an advanced stage and it should now be somewhat easier to arrange for the multiplication in the village of the quantities of improved seed required. Thus, the Third Plan provides for the various factors required for the successful execution of village production plans.

PANCHAYATI RAJ

11. The establishment of democratic institutions at the district and block levels and the role assigned to the Gram Sabha and the Village Panchayat constitute fundamental and far-reaching changes in the structure of district administration and in the pattern of rural development.

which progress is achieved in mobilising the village community for increasing production, every other problem in the rural areas becomes easier of solution and more intensive development can be undertaken in other directions, specially rural industry and the provision of social services. The growth of agricultural production is of such critical importance that, in the immediate context of the Third Plan, the principal test to be met by the community development movement must be its practical effectiveness as an agricultural extension agency. It is, therefore, essential for the community development organisation to take all steps necessary to strengthen itself in this respect, and to accept responsibility for achieving the targets of agricultural production on the basis of the largest possible local effort. At the same time, it is incumbent on the Agriculture Departments and other Departments concerned with agricultural production that they must place at the disposal of the community development organisation at the district and block levels, the necessary expert supervision and guidance and the supplies, trained manpower and other resources needed.

Village Production Plans

9. The principal means for involving all cultivators in the village in the agricultural effort and mobilising effectively the resources of the local community is the village production plan. The main elements in agricultural production programme at the village level are:

(i) full utilisation of irrigation facilities, including maintenance of field channels in good condition by the beneficiaries, repairs and maintenance of community irrigation works and economy in the use of water;

(ii) increase in the area under multiple cropping;

(iii) multiplication in the village of improved seed and its distribution to all cultivators;

(iv) supply of fertilisers;

(v) programme for composting and green manures;

(vi) adoption of improved agricultural practices, such as, soil conservation, contour-bunding, dry farming, drainage, land reclamation, plant protection, etc.;

(vii) programme for new minor irrigation works to be undertaken in the village, both through community participation and on an individual basis;

(viii) programme for the introduction of improved agricultural implements;

(ix) programme for increasing the production of vegetables and fruits;

(5) development of facilities for education and adult literacy;

(6) optimum utilisation of resources available to Panchayati Raj institutions such as finance, personnel, technical assistance and other facilities from higher levels, and efforts by them to raise their own resources;

(7) assistance to the economically weaker sections of the village community;

(8) progressive dispersal of authority and initiative with special emphasis on the role of voluntary organisations;

(9) understanding and harmony between elected representatives and public servants to be achieved through comprehensive training in education and a clear demarcation of duties and responsibilities, and progressive increase in competence both among officials and non officials; and

(10) cohesion and mutual self-help within the community.

12. From the limited experience gained so far, the following suggestions are offered for ensuring the effective and successful working of Panchayati Raj institutions:

(1) while developing institutions at the higher levels, the greatest stress should continue to be laid on the work of the Gram Sabha and the Panchayat at the village level. It is at the village level that the efforts of the people have to be mobilised and there is the largest scope for securing community action. Both on the part of the Gram Sabha and the Village Panchayat the approach of unanimity or near unanimity should be encouraged, so that various activities are undertaken with the general consent and goodwill of the community.

(2) technical officers at the district level should endeavour to make their advice and assistance available to extension officers at the block level and to the Panchayat Samitis for the initial preparation of programmes and schemes before decisions are taken. In turn, Panchayat Samitis should seek and welcome such assistance since a considerable proportion of extension personnel at the block level are necessarily without adequate experience, but can render better service if they receive the necessary guidance and help from officials at the district level.

(3) the manner in which the block extension team, comprising the Block Development Officer and Extension Officers in different fields of development, functions is of the highest importance for the success of Panchayati Raj. To assist

Their significance lies in the fact that, subject to guidance and supervision by the State Government, the responsibility for the implementation of rural development programmes will now belong to the Block Panchayat Samiti working with Panchayats in the villages and the Zila Parishad at the district level. These institutions have not been at work long enough to permit more than a preliminary statement of the problems which are likely to require careful attention. In considering these, certain aspects deserve to be stressed. The primary object of Panchayati Raj is to enable the people of each area to achieve intensive and continuous development in the interest of the entire population. The elected representatives should be encouraged to value the development of Panchayati Raj as offering new avenues of service to the people rather than opportunities for the exercise of authority. The concept of Panchayati Raj is not limited to the non-official and democratic organisations associated with it. Representing, as it does, a distinct level of responsibility and functions within the general scheme of administration, Panchayati Raj comprehends both the democratic institutions and the extension services through which development programmes are executed. Extension personnel at the block and village levels, although functioning within the jurisdiction of the Panchayat Samiti, form part of a larger administrative and technical network, which extends to the district and even beyond it. It is vital to the permanent success of Panchayati Raj that the integrity of the structure of technical and administrative services provided by Government and their ability to fulfil the duties and responsibilities cast upon them should be fully ensured, while their knowledge and experience are made available to the elected bodies at the district and block levels. It is also of the highest importance that there should be clear recognition of the distinct role of federal cooperative organisations functioning at the State and district levels, as in the field of banking, marketing, processing, distribution and education and training. Large obligations are undertaken by various cooperative organisations and they should be enabled to fulfil them in accordance with the approach and principles of the cooperative movement. The economic development of rural areas is still in its beginnings and large possibilities lie ahead. It is the object of the new institutions and relationships now being established to help each area to realise these possibilities to the utmost limits of its resources. From this aspect the following are among the main tests by which the success of Panchayati Raj will need to be measured from time to time:

(1) agricultural production as the highest national priority during the Third Plan;

(2) development of rural industry;

(3) development of cooperative institutions;

(4) full utilisation of the local manpower and other resources;

to utilise the results of research and to practise scientific agriculture, adequate assistance in the form of technical advice and supplies of improved implements, seeds, fertilisers and credit must reach them at the right time. It is essential for the success of these complex but vital programmes that the responsibility of all official agencies and organisations concerned should be properly defined and there should be no ambiguity in the responsibility of the higher technical officers to provide the necessary guidance and supervision. In other words, in these matters, an uninterrupted line of responsibility reaching down to the village units should be assured.

While the responsibility of the official agency is defined and enforced as above, the functions of non-official leaders should be:

(i) to mobilise public participation and promote the acceptance of programmes by the people;

(ii) to assist village panchayats and cooperatives in their work;

(iii) to assist in training programmes for village leaders and others;

(iv) to organise programmes for the benefit of the community, using local man-power resources; and

(v) to promote the welfare of the weaker sections.

RATIONALISATION OF DISTRICT ADMINISTRATION

14. The introduction of Panchayati Raj raises the wider question of the reorganisation of district administration. It is not generally realised that over the past decade changes in district administration have been somewhat haphazard. When the community development programme was taken up, the extension organisation had to be super-imposed on the traditional district administration without adequate connecting links. The consequence is that in many districts the following organisations are working on parallel lines with their activities largely uncoordinated;

(i) the revenue administration which looks after certain specified development functions, such as taccavi advances, recoveries, etc.;

(ii) the established Development Departments at the district, taluka and other levels;

(iii) the community development organisation with block officers and village level workers, linked at the village level with panchayats and cooperatives; and

(iv) Local Boards (where these have not yet been abolished).

With the introduction of Panchayati Raj, the functions of Panchayat Samitis include both community development activities and several activities hitherto entrusted to Local Boards. In the nature of things, there is

the Panchayat Samiti effectively, these officials must continue to function as a team, the Block Development Officer providing the necessary co-ordination and leadership, and Extension Officers in different fields participating actively in formulating programmes and schemes for the consideration of the Panchayat Samiti and its Standing Committees, executing them impartially in accordance with the rules, and ensuring that the supplies and services needed are organised efficiently. Adequate supervision over the work of the village level workers is essential. Care should be taken to see that the Block Development Officer and the Extension Officers undertake extensive touring within the block and are not tied up excessively with discussions at headquarters.

(4) in the work of Panchayat Samitis, the main stress should be on the preparation and implementation of carefully considered block plans. These, along with village plans, provide the essential means for securing intensive and continuous development. Block and village plans, which are technically well-conceived, will go a long way to counteract ad hoc decisions and local pressures.

(5) the introduction of Panchayati Raj enhances greatly the responsibility of the technical departments at the State level. They should transmit the best guidance and experience available in each field of development, provide for adequate training programmes for the elected representatives, and assist them generally in fulfilling the onerous responsibilities which Panchayati Raj places on them.

(6) the Collector of the district will continue to have a large share of responsibility in facilitating the success of Panchayati Raj institutions. He has the duty of ensuring coordination at the district level between the Zila Parishad and the technical officers in different fields, close contacts between the latter and the Panchayat Samitis and Extension Officers at the block level, and a continuing flow of technical advice and guidance from departments at the State level. An important aspect of the Collector's work will be to assist democratic institutions and the public services in developing the right conventions in day-to-day work and in administrative relationship based on recognition of their distinctive contribution in fulfilling common objectives.

13. For the effective implementation of the programme of community development, several technical Departments have to work together in a coordinated manner. If the vast majority of cultivators are to be assisted

specially during the slack agricultural seasons, will be implemented to a large extent through community development organisations. The programme will be extended first to areas with heavy pressure of population and considerable under-employment, and later to other areas. This programme should afford an opportunity of the highest value not only for providing additional employment, but also for implementing the community development programme with fresh emphasis on the maximum possible utilisation of local manpower resources and effort and participation on the part of local communities.

still considerable overlapping which calls for some measure of rationalisation in district administration and fresh definition of functions and relationships.

Weaker Sections and the Problem of Employment

15. From time to time evaluation reports on the community development programme have drawn attention to the fact that the benefits did not reach the less privileged sections of the village community in adequate measure. Recent studies report a degree of improvement in this respect. A study group set up by the Ministry of Community Development and Cooperation is at present engaged in considering how far and in what manner the community development programme can promote the economic development and welfare of the weaker sections of the community. The problem should be seen in the broader context of development within the rural economy. The welfare of weaker sections is closely related to that of the village community as a whole, and in a sense a large part of the village community consists of those who may be described as being economically weak. The main weaknesses of the present village economy are low income, low productivity and lack of continuous employment. Without the rural economy as a whole growing rapidly enough, it is difficult to solve the problem either of the community in the village or of its weaker sections. The essential aim must be to bring about a more productive agricultural economy and a larger range of non-agricultural occupations in the village so as to increase production and employment and, at the same time, much greater attention should be given in all activities to the needs of the less privileged sections.

16. In the efforts which have been made over the past three years to secure greater coordination between the community development and Gramdan movements, their common objectives have been emphasised. These include the acceptance by the village community of responsibility for the welfare, employment and livelihood of all its members. This is of the greatest importance from the point of view of the weaker sections in the village.

17. The block organisation can render useful service by assisting the implementation of the land reform legislation which has been already enacted by creating public opinion and educating the people in their rights and obligations. Other measures which the block organisation can take to the immediate advantage of the weaker sections of the population are to increase subsidiary employment in the villages, raise the productivity of village industries and of village artisans, organise labour cooperatives, and promote the fullest possible utilisation of the manpower resources of the area. The programme of rural works leading to employment opportunities by the last year of the Third Plan for about 2·5 million persons,

than, Himachal Pradesh and Uttar Pradesh being at relatively higher levels than in other parts of the country. At the end of the Third Plan, the per capita consumption is expected to rise to 5·1 oz per day. For a balanced diet, the minimum requirement is considered to be about 10 oz per day, so that the levels of consumption at present visualised are wholly inadequate.

Review of Progress

4. During the First Plan among the animal husbandry programmes undertaken were the establishment of 146 key village blocks with artificial insemination centres and 25 gosadans. A pilot scheme for the eradication of rinderpest was also initiated. During the Second Plan 196 new key village blocks were taken up and 114 key village blocks established in the First Plan were expanded. Key village blocks set up in the First Plan comprised 4 separate units and those set up in the Second Plan included 6 units. In all, by the end of the Second Plan about 2000 key village units were established. By 1960, 670 artificial insemination centres had been set up. During the Second Plan 34 more gosadans were established and 246 goshalas were selected for development. By the end of Second Plan about 4000 veterinary hospitals and dispensaries had been established of which, 650 were set up during the First Plan and about 1900 during the Second Plan. In the Second Plan the gosadan scheme was modified so as to allow for the setting up of gosadans both by State Governments and by private institutions. With a view to reducing losses, it was proposed that charmalayas should be provided at gosadans with equipment and machinery for flaying and curing of hides and utilisation of carcasses. The total Plan outlay on animal husbandry in the First Plan was Rs. 8 crores and in the Second about Rs. 21 crores.

Programmes in the Third Plan

5. Development of animal busbandry during the first two Plans suffered under several limitations. Some of these were of a continuing nature, such as the large proportion of uneconomic and surplus cattle, deficient nutrition and shortage of breeding bulls. A proportion of the key village blocks were located in "non-descript" areas, outside the established breeding tracts. There was also shortage of trained personnel in several States. In the Third Plan, which provides about Rs. 54 crores for animal husbandry, the key village programme is being reorganised so as to provide for about 10 units in each block and establishment of central artificial insemination centres. The programme for rinderpest is to be intensified and a large castration programme is proposed to be taken up.

6. *Breeding.*—As was stated in the Second Plan, there are 25 well-defined breeds of cattle and 6 well-defined breeds of buffaloes in India. These are distributed in different parts of the country. Each breed of

CHAPTER XXI

ANIMAL HUSBANDRY, DAIRYING AND FISHERIES

THE need for expanding the production of supplementary and subsidiary foods, especially proteins, has been increasingly realised in recent years. The demand for these articles has speedily increased and, with rise in incomes, is likely to increase even more rapidly in the future. The prospects of augmenting the supply of milk and milk products, table birds, eggs and meat depend ultimately on progress in the development of animal husbandry. In the development of fisheries significant results have already been achieved, but still a vast potential remains to be tapped.

ANIMAL HUSBANDRY

2. Development of animal husbandry is envisaged as an integral part of a sound system of diversified agriculture. Emphasis will be laid on mixed farming, a system in which crop production and animal husbandry are dovetailed for efficient and economic utilisation of land, labour and capital. The integration of farming with animal husbandry is essential for the fuller utilisation of farm bye-products, maintenance of soil fertility, fuller employment for agriculturists throughout the year and increase in rural incomes.

3. According to the 1956 Livestock Census, there were 306 million farm animals. Of these, cattle numbered about 159 million and buffaloes about 45 million, constituting together a fourth of the world's bovine population. There were, in addition, 39 million sheep, 55 million goats, 8 million other animals and 95 million poultry. The productivity of India's livestock is generally low. Although high individual yields of milk are realised in some breeds of cattle and there is evidence of a slight increase, India's average yields continue to be extremely small. Thus, the average milk yield per lactation of cows is in the neighbourhood of 400 lb and of buffaloes a little above 1100 lb compared to about 5000 lb or more in advanced western countries. The total production of milk which was estimated at about 17 million tons in 1951 and at about 19 million tons in 1956, is at present reckoned at about 22 million tons. By the end of the Third Plan it is expected to go up to about 25 million tons. Statistics of milk consumption are far from satisfactory. The average per capita consumption of milk, including milk products, was estimated in 1951 to be 4·76 oz per day and is now placed at about 4·9 oz per day. There were wide variations between States, consumption in Punjab, Rajas-

where pastures have been developed, cultivation of fodder crops on marginal and sub-marginal lands, introduction of suitable leguminous crops in rotation with paddy, construction of silo pits and popularisation among farmers of cultivation of pasture grasses and feeding of balanced rations. The need to organise the marketing of livestock and livestock products through cooperative marketing societies of cattle-owners has been stressed. The committee has also made a number of proposals for improving existing arrangements concerning artificial insemination.

8. A scheme for the progeny testing of bulls required for key village areas and cattle farms was initiated during the Second Plan with the Hariana breed of cattle and the Murrah breed of buffalo. Eventually, it is proposed that such progeny testing scheme should be introduced for each of the important breeds. The scheme is being extended to the Ongole breed in Andhra Pradesh and the Kankrej breed in Gujarat.

9. Registration of cattle conforming to certain prescribed standards is an important means for securing cattle improvement. It is proposed that in the main breeding tracts cultivators should be encouraged to form breeding societies which will provide for registration of cattle and recording of milk yields and will serve as a source of supply of breeding bulls required for other areas. During the Third Plan, this scheme will concentrate on the Hariana, Gir and Ongole breeds of cattle and the Murrah breed of buffaloes.

10. The shortage of breeding bulls has been one of the principal handicaps in implementing animal husbandry programmes. To overcome this difficulty, the use of artificial insemination is being rapidly extended. There are at present 125 Government cattle breeding farms, but the total production of bulls is in the neighbourhood of about 5000, which is but a fraction of the numbers actually needed. The Third Plan provides for the setting up of 11 bull-rearing farms in the breeding tracts. It also provides for subsidising the rearing of about 30,000 bull calves. This scheme can be considerably expanded if adequate facilities are made available to village panchayats and to cattle-breeding cooperatives. It is also proposed to expand the herds at 33 existing Government cattle breeding farms and improve their management, so that they can produce a larger number of superior bulls. A number of new livestock farms are also to be established. In the hill areas, livestock development has generally lagged behind. These areas, however, offer scope for cross-breeding with exotic breeds. It is proposed to establish an exotic breeding farm for producing bulls for the development of hill cattle. A difficult problem in the major breeding areas is presented by continuing exports of high-yielding animals to large cities, where they are discarded after one or two lactation periods. Measures are being devised for preventing this national loss.

cattle has a limited number of high class specimens. A few of the breeds are of the dairy type, in which the females yield a large quantity of milk, while the bullocks are not of high quality. A large majority of the breeds, however, are of the draught type, in which the cows are poor milkers, but the bullocks are superior in quality. In between, there are a number of breeds which may be described as "dual purpose", in which the females yield more than an average quantity of milk, while the males are good working bullocks. These well-defined breeds are found in the dry parts of the country. Outside these areas, over large parts of the country, specially in the east and the south, the cattle are "non-descript" and do not belong to any defined breed. The all-India breeding policy drawn up by the Indian Council of Agricultural Research and accepted by the Central and State Governments envisages that in the case of well-defined milch breeds the milking capacity should be developed to the maximum by selective breeding and the male progeny should be used for the development of 'non-descript' cattle. In the case of well-defined draught breeds, the aim is to put as much milk into them as possible without materially impairing their quality for work. The breeding policy is, thus, to evolve and develop "dual purpose" breeds, which will provide both good bullocks for efficient cultivation and increased quantities of milk for human consumption. Besides pursuing these objectives during the Third Plan, as an experimental measure, it is proposed to undertake cross-breeding with exotic breeds in regions of high altitude which have heavy rainfall. To meet the requirements of imported stock, it is proposed to set up a farm for maintaining a nucleus herd of Jersey animals.

7. The key village scheme, which has been the main programme for intensive cattle development during the first two Plans, has been recently re-examined by an expert committee. The committee has suggested that State Governments should review the operation of the key village blocks with a view to improving their working and closing down such of the blocks as have not produced satisfactory results. To overcome the shortage of high class bulls, it has been recommended that State Governments should formulate well-considered purchase programmes, and progeny testing programmes should be taken up at Government farms as well as at private farms where the necessary facilities exist or can be provided. To achieve satisfactory breeding control in the key village areas, it is proposed that the castration programme should be intensified and propaganda undertaken in favour of early castration of males. It is also proposed that the programme for the rearing of bull calves in the key village areas should be expanded. The committee has drawn attention to the fact that the feed and fodder development programme associated with the key village programme has not made satisfactory progress. To remove this defect, the committee has made a number of recommendations, including better use of the existing fodder resources, control of grazing

An aspect of the problem of surplus cattle is the menace of wild and stray animals. During the Second Plan, a scheme for catching, taming and disposing of wild and stray cattle was initiated as part of the gosadan programme. The scheme is in operation in Delhi, Jammu and Kashmir, Madhya Pradesh, Punjab and Uttar Pradesh.

Having regard to the size of the problem of surplus cattle and its special features, with a view to elimination of scrub male stock, it is proposed to undertake a large-scale programme of castration during the Third Plan. The programme envisages that mass castration work will be initiated first in areas in which intensive livestock development programmes have been taken up and will be later extended to other areas.

13. *Extension of veterinary facilities and disease control.*—In the course of the Third Plan the number of veterinary hospitals and dispensaries is expected to increase to 8000 and every development block will have at least one such hospital or dispensary. There will also be increased production of vaccines and sera required for the control of contagious diseases. Under the programme for eradication of rinderpest carried out during the Second Plan, about 90 million heads of cattle have been protected, leaving a balance of about 41 million cattle. It is expected that by 1963-64, the entire bovine population of the country will have been vaccinated. It is proposed to undertake a "follow up" programme to set up immune belts along the border and to establish 10 more quarantine stations at important points of entry of animals, bringing the total number to 28.

14. *Piggery Development.*—Piggery products provide cheaper animal proteins and are important for improving the nutritional requirements. Bristles as by-products are valuable export commodities. In the Second Plan 13 piggery breeding units for the production of breeding boars for use in piggery development blocks were set up. With a view to utilising breeding materials from these units 28 piggery development blocks were also established. In addition, two regional pig-breeding stations-cum-bacon factories were established at Aligarh in Uttar Pradesh and at Haringhata in West Bengal. The Third Plan provides for piggery development on a larger scale. It is proposed to establish two regional breeding-cum-bacon factories, 12 piggery units and 140 piggery development blocks. Intensive development in this industry can make a material contribution towards raising the economic levels of several groups among the weaker sections of the village community.

15. *Equine breeding.*—Before partition, the requirements of the armed forces for horses, mules, etc. were met, for the most part from special breeding schemes sponsored by the Government in the canal colonies, and were also supplemented to some extent by imports from

11. *Feeding and nutrition.*—Increase in numbers accompanied by inadequate feeding and deficiencies in nutrition are responsible to a large extent for deterioration in the quality of livestock. Development of grazing areas, increased production of fodder, improved arrangements for preserving it and better utilisation of agricultural by-products are, therefore, important aspects of animal husbandry development. Among the measures proposed in the Third Plan are work on forage improvement at livestock farms, establishment of forage demonstration plots in villages, distribution of planting materials, conservation of surplus fodder through ensilaging, feeding of selected cattle on balanced rations, adoption of improved cultural practices and establishment of fodder demonstration-cum-training centres. In periods of scarcity fodder banks have considerable value. One such bank was established during the Second Plan. It is proposed to set up two more fodder banks during the Third Plan. It is also proposed to set up a Forage and Grassland Research Institute. Suitable areas will be selected for the development of mixed farming, preference being given to river valley areas and others in which successful livestock development has already taken place. In these areas, fodder and leguminous forage crops will be grown in rotation with food and cash crops, financial assistance will be given for the purchase of 'dual purpose' cattle of high quality, and forage seed farms as well as demonstration centres will be set up.

12. *Surplus cattle.*—The seriousness of the problem of surplus and uneconomic cattle is widely recognised, although estimates of the numbers of such cattle vary. As was pointed out in the Second Plan, large numbers lead to poor feeding and poor feeding comes in the way of attempts to raise productivity. Weeding of inferior stock is a necessary complement to a programme of cattle improvement and systematic breeding. The gosadan scheme, which was worked out by the Cattle Preservation and Development Committee in 1948, was introduced as a partial answer to this problem. The scheme envisages segregation of useless cattle so as to avoid their further multiplication and the resultant damage to crops. Over the past ten years 59 gosadans have been established, 25 during the First Plan and 34 during the Second Plan. In the Third Plan, it is proposed to set up 23 more gosadans. In its very nature, the programme for establishing gosadans presents certain difficulties, the most important of these being the non-availability of suitable sites in the interior of forest areas where the necessary grazing facilities are available. The scheme has been modified from time to time with a view to making gosadans a more economic proposition. In this connection, the need for providing facilities for the full utilisation of hides, bones, horns, etc. has been stressed and attempts have been made to reduce overhead costs.

17. *Poultry development.*—Together with piggery, poultry has employment potentialities both in the rural and urban areas, particularly for the weaker sections of the community. However, the poultry industry in India is essentially a cottage industry without being linked with commercial hatcheries, commercial feed industry and organised marketing of poultry products. During the Second Plan 5 regional poultry farms were established and equipped for the production of superior birds for breeding purposes. These regional farms distributed chicks to State poultry farms, extension centres and poultry breeders. During the Second Plan 269 poultry extension centres were also established. The Third Plan provides for the expansion of 60 State poultry farms, 3 regional poultry farms and 50 extension-cum-development centres. Each poultry development centre has also a demonstration unit of 100 birds, with an egg defertilisation unit for demonstrating modern methods of poultry keeping to the farmers. Commercial hatcheries will be set up in these centres. It is expected that as a result of these measures the annual average egg production will go up from 60 to 70 eggs per hen. Two regional duck breeding farms, 17 duck extension centres, one egg powder factory and 15 centres for the manufacture of poultry feeds are also proposed to be established.

18. *Marketing.*—In the interest of breeding good quality livestock, it is essential to improve the existing arrangements for the marketing of livestock and livestock products. This is an aspect of development which has hitherto received little attention. Trade practices need to be regulated and amenities such as arrangements for shelter and water for animals should be provided in market yards. Facilities for giving authentic information to breeders regarding prices and marketing prospects are at present quite unsatisfactory. There should be a programme for marketing of livestock and livestock products in each State and especially in the key-village blocks. Schemes for correct shearing, grading and marketing of wool are of considerable importance. The plans of States also include schemes for demonstrations and propaganda regarding correct methods of flaying and utilisation of carcasses. A number of States have made specific provisions for improving slaughter houses, development of meat markets and in some cases setting up of abattoirs run on hygienic lines.

19. *Hide flaying, curing and carcass utilisation.*—Due to the absence of a sufficient number of modern slaughter houses and abattoirs, a large proportion of hides produced in the country are of 'fallen' type which are inferior in quality as compared to those from the slaughter houses. There is also lack of facilities for proper flaying and scientific curing with the result that the hides and skins produced in the country are inferior in quality and fetch lower prices in the international market.

abroad. Despite progress in mechanisation, there is still a considerable demand for horses and mules for mountain artillery, animal transport companies and for pack transport etc. for use in the mountainous regions. These requirements, together with those of the Police, are being met from the 'unbound' system still prevailing in some districts of Uttar Pradesh and Punjab and partly through imports.

The policy of preserving the existing breeds and the objective of establishing a breed of Indian horses have resulted in evolving the 'Indian Thoroughbred' which has good speed, stamina, patience, persistence and easy gait, and is now in considerable demand by the turf clubs. Except Kathiawari and Marwari breeds, no serious attempts have been made to improve other breeds such as Bhutia, Manipuri, Spiti and Shahabadi etc. No systematic efforts were made for improving and developing the breeds of horses during the First and Second Plans. During the Third Plan a horse-breeding farm will be established and will maintain 48 mares and 2 stallions and 20 donkeys and 5 donkey stallions. The farm will produce 12 horse stallions and 6 donkey stallions every year. This stock will be located at 10 selected stud centres for the improvement of local breeds. It has also been agreed to import a limited number of horses for the next four years. Other aspects of the programme for horse-breeding, such as the establishment of a national stud, cooperative breeding schemes and the proposal for more private studs are under examination.

16. *Sheep and wool development.*—Of the 72 million lb. of wool produced in the country, about one-half is exported as carpet wool, while 15 to 17 million lb. of semi-processed wool is imported. In 1959-60 the export of wool and of sheep and sheep products contributed Rs. 26·6 crores in foreign exchange, while the cost of imported wool amounted to Rs. 8·8 crores. The export value of sheep and sheep products is estimated to increase to about Rs. 35 crores by the end of the Third Plan. During the Second Plan 4 sheep breeding farms for the production of superior rams were started. Rams were distributed to 305 sheep and wool extension centres in the established breeding tracts for the improvement of local stock. In addition to providing breeding facilities these centres also demonstrate improved methods of shearing, grading and marketing. In the Third Plan 15 sheep breeding farms will be established and 17 farms expanded. In all 2000 to 2500 quality rams will be supplied from these farms to flock owners in the rural areas. As a result of various measures, the production of wool by the end of the Third Plan is expected to go up to about 90 million lb. In view of the greater demand by indigenous industry for quality wools, a large programme for correct shearing as well as systematic grading is to be taken up in Rajasthan. The plans of some States provide for loans for the introduction of sheep with a view to the development of mixed farming.

Pradesh, the former Bombay State, U.P. and Rajasthan. Provision has also been made for the development of Rathi and Tharparkar breeds of cattle maintained by the nomadic cattle breeders of Rajasthan.

22. *Central Council of Gosamvardhana.*—With a view to associating private institutions and organisations which are already engaged in cattle development, particularly the cow, the Central Council of Gosamvardhana was reorganised in 1960. The Council has been assigned specific functions such as to organise, implement and coordinate activities relating to the preservation and development of cattle and to administer schemes for increasing milk yield and improving draught quality. The Council will also run training centres for goshala and charmalaya workers, organise exhibitions and issue journals, films and pamphlets for field workers. The Central Council of Gosamvardhana is also expected to bring about better coordination between various agencies interested in Gosamvardhana work.

23. *Education and research.*—Educational programmes were developed to a considerable extent in the Second Plan with the establishment of three new veterinary colleges and the expansion of five colleges out of the 14 existing ones. In addition to the post-graduate college established at the Indian Veterinary Research Institute, Izatnagar, four veterinary colleges at Mathura, Madras, Bombay and Patna were upgraded for imparting post-graduate training. In the Third Plan, two new veterinary colleges will be opened, one in Gujarat and the other in Bihar. An extension wing is proposed to be attached to each college to provide adequate training in extension methods pertaining to animal husbandry. The estimated demand for 5000 veterinary graduates during the Second Plan has been largely met. The requirements of veterinary graduates during the Third Plan period are estimated at 6800 as against the output of about 5800 from the existing colleges. Thus, there will be a gap of 1000 veterinary graduates to be covered. It is felt that with the fuller use of the existing institutions together with the establishment of two new veterinary colleges during the Plan period, requirements of veterinary graduates would be adequately met. Arrangements will also be made to train about 70,000 stockmen, which will meet the requirements of the Third Plan.

In order to undertake fundamental and other studies in sheep and wool production, a Central Sheep Breeding Research Institute will be established in Rajasthan with two sub-stations, one in the hill region of Punjab and the other in the Nilgiris. Basic aspects concerning the utilisation of land in relation to breeding of different types of sheep, problems of hybridisation for high production, trials of imported breeds and nutrition in relation to production would be investigated at this institute. This

Exports of hides and skins are expected to go up from Rs. 28 crores in 1960-61 to Rs. 34 crores in 1965-66. Pressure on quality supplies is increasing from the indigenous leather manufacturers. In this connection the main problems are the scattered sources from which carcasses are to be collected and the fact that local flayers have tended to give up their age-old profession. This calls for a large scale programme for the better collection of fallen hides and for improved flaying. The prerequisites for such a programme are:

(i) timely recovery of carcasses and full utilisation of all by-products such as meat, bones, tallow, horns, etc.;

(ii) tanning of hides and skins by improved methods under the guidance of trained personnel; and

(iii) provision of adequate training facilities at selected centres.

In the Third Plan it is proposed to set up one large and 14 small hide flaying, curing, and carcass utilisation centres, and 2 mobile bone crushing units. A regional training centre in hide flaying, curing and utilisation will also be established.

20. *Cattle insurance.*—Sometime the farmers suffer considerable losses due to the death of their draught or milch animals when there is an out-break of epidemic. A beginning has been made by the Cooperative Mutual Insurance Company, Bombay to insure milch animals and draught cattle in the States of Maharashtra and Gujarat. The Government of Kerala has also shown interest in such a scheme. Schemes to investigate the possibilities of cattle insurance have been proposed by Andhra Pradesh, Uttar Pradesh, Maharashtra, Rajasthan, Mysore, Madras and Punjab.

21. *Other schemes.*—Cattle development activities are proposed to be intensified through private institutions such as goshalas. In the Second Plan, 246 selected goshalas were taken up for the production of superior bulls, which will be further distributed for breeding purposes, and also for increasing the production of milk. It is proposed to provide 168 more goshalas with financial and technical assistance to convert them into cattle breeding-cum-milk production units.

There are traditional nomadic cattle breeders in some parts who maintain good specimens of certain breeds of cattle. There is need for improving the economic conditions of these professional herdsmen to continue their age old profession to develop and improve the herds, so that good genetic material available with them might be used for development in non-descript areas. In the Second Plan the scheme for the rehabilitation of nomadic cattle breeders was taken up in Andhra

Programmes for the Third Plan

27. The policy to be pursued in regard to dairying is to develop dairy projects with greater emphasis on milk production in the rural areas linked up with plans for marketing of surplus milk in the urban centres. The supply and collection of milk will be undertaken by a network of producers' cooperatives in the villages. The processing and distribution of milk and manufacture of milk products will be organised through plants operated, as far as possible, on cooperative lines. It is expected that reliance on cooperative organisations would help in enlisting public participation and add to the pool of funds available under the Plan for this activity. In addition to development aimed at in the public sector, manufacture of milk products is proposed to be encouraged in the private sector. In the Second Plan, two units each for the manufacture of infant milk foods and malted-milk foods and one large-scale unit for sweetened condensed milk were set up. During the Third Plan two plants with a capacity of about 900 tons will start the production of infant milk foods, three units with a total capacity of 5300 tons per annum will produce condensed milk and one unit will manufacture 670 tons per annum of milk beverages.

28. During the Third Plan, 55 new milk supply schemes will be taken up in cities with population exceeding one lakh and in growing industrial townships. In order to utilise economically the milk available in certain milk pockets where there are no ready markets for the disposal of fluid milk at remunerative price, rural creameries for the production of butter, ghee, cheese and other bye-products such as casein, lactose, milk powder etc. will be undertaken. It is proposed to establish 8 such rural creameries, 4 milk product factories and 2 cheese factories for developing the rural milk pockets. There is also a general shortage of concentrates which raises the cost of production of milk. Production of balanced rations through the use of various agricultural wastes and by-products such as wheat and rice brans, bagasse, molasses, decorticated cake etc. can go a long way in making available cheaper feeds for the cattle. It is proposed to establish 4 cattle feed compounding factories in the close vicinity of large milk supply plants. A provision of Rs. 36 crores has been made for dairy schemes in the Third Plan.

In order to give an impetus to dairy prorgammes, arrangements have to be made for the manufacture of dairy equipment and machinery within the country. Fabrication of dairy equipment, specially for small units, should be encouraged so as to popularise dairying as a local industry in the rural areas. Four firms have already been licensed for the manufacture of dairy equipment. These will start production during the Third Plan.

Institute will also deal with the problem of wool technology in relation to production and processing. The function of the sub-station would be to undertake experimental breeding for raising acclimatised strains of imported sheep breeds obtained from temperate climates.

DAIRYING AND MILK SUPPLY

24. The dairy industry in India is faced with several problems, such as, scattered and small-scale milk production, inadequate transport facilities in most parts of the country, dependence on imported plant and machinery required for milk collection, processing and manufacturing, shortage of technical and skilled personnel and the lack of properly organised systems of marketing. Efforts have, therefore, to be directed towards the collection of surplus milk from rural areas on an organised basis and the development of assured supply of good quality milk and milk products at reasonable prices to the consumers.

REVIEW OF PROGRESS

25. The First Plan provision of Rs. 7·81 crores was almost fully utilised. The main programmes related to the supply of milk to large cities under hygienic conditions supported by schemes of procurement from rural areas.

In the Second Plan, a provision of Rs. 17·44 crores was made for the dairy development programmes. Against this provision, an amount of Rs. 12·05 crores will be utilised. The Plan included 36 dairy plants for supply of milk to large consuming centres, 12 rural creameries and 7 milk product factories for the utilisation of surplus milk in milk pockets, expansion of 12 dairies and salvage farms, training of technical personnel and survey of dairy areas.

26. Due to the shortage of foreign exchange and the difficulty in obtaining plant and machinery, dairy development programmes had to be confined mostly to those schemes, for which equipment was available within the country, or was provided for under foreign aid programmes. Dairies have already been set up in Delhi, Poona, Kudgi, Kurnool, Guntur, Kodaikanal and Haringhata. Pilot milk schemes have also been started in some of the important towns. In all, 28 milk supply schemes are at various stages of implementation. Two milk product factories, one at Amritsar and the other at Rajkot and three rural creameries—one each at Barauni, Aligarh and Junagadh are being set up with foreign aid. There were 2257 cooperative milk supply societies and 77 milk supply unions in the country at the end of the year 1958-59. With membership of 211,131 and owned funds of Rs. 183 lakhs, they sold milk and milk products worth Rs. 11·32 crores.

developed areas, were to be divided into plots and leased out on reasonable terms to the displaced cattle owners. Allottees would have to construct necessary cattle sheds and other buildings according to approved plan at their own cost. Facilities for the marketing of milk would be provided. Thus, the removal of milch animals from cities and their rehabilitation in colonies would be regarded primarily as a health-cum-slum clearance measure, and the main responsibility for it would devolve on city municipalities and corporations.

RESEARCH, TRAINING AND EDUCATION

32. The National Dairy Research Institute was shifted from Bangalore to Karnal with a view to increasing facilities for research and training. The Institute will be fully established during the Third Plan with its research divisions in dairy husbandry, technology, chemistry, bacteriology, nutrition, extension and economics, so as to meet the increasing requirements of the fast expanding dairy industry. The Bangalore sub-station of the Institute will also be expanded. In the field of dairy education, training facilities for the Indian Dairy Diploma (I.D.D.) at Bangalore, Allahabad, Anand and Aarey and for the B.Sc. (Dairying) and post-graduate studies at Karnal are proposed to be expanded. Training courses upto the graduate level in dairying will also be started at the Agricultural Institute, Anand. In-plant training in large dairies which has already been started will be continued and expanded during the Third Plan. The F.A.O. regional training programme which has been in progress will be continued and expanded. It is also proposed to organise tutorial workshops for teachers at various dairy training centres together with other refresher courses for different categories of technical personnel needed for the various dairy projects. The requirements of dairy personnel during the Third Plan are estimated at 2830, of which 625 will be degree holders, 975 diploma holders and 1230 other categories of personnel. It is expected that these requirements of technical personnel will be adequately met.

FISHERIES

33. The aquatic resources of Indian waters are varied and abundant. With a coast'line of about 3000 miles, a continental shelf of more than 100,000 square miles, the two wide arms of the Indian ocean, and large numbers of gulfs and bays along the coast, the marine resources are extensive. The estuarine resources are also substantial with extensive back-waters, tidal estuaries, lagoons, and swamps along the entire coast-line. The principal rivers with their main tributaries having a length of about 17,000 miles, the canals along with irrigation channels about 70,000 miles in length and large numbers of lakes, reservoirs, tanks and ponds constitute a rich potential source of inland fisheries. Fishing and allied industries provide employment for about a million fishermen, most of whom live on the verge of poverty. Income from fisheries can

Most of the milk supply schemes started during the Second Plan will be expanded to increase the intake of surplus milk offered by the producers. Since milk has to be often transported from long distances, special provision has been made for increasing facilities for refrigerated rail transport of milk to large milk processing plants.

29. In addition to meeting the requirements of towns, the vital interests of agriculturists have been kept in view while drawing up programmes for dairy development. Emphasis will be laid on the development of smaller dairy units and creameries in villages run on cooperative lines in order to strengthen the base of the agricultural economy through mixed farming. Salvage farms will be set up near big cities to preserve the stock of good cattle after completion of lactation. Intensive cattle development schemes will be undertaken in areas in which dairy and milk supply schemes are organised.

30. Dairying programmes will be effectively interwoven with the economy of the surrounding villages with a view to promoting the policy of encouraging the development of dual purpose animals. It is widely recognised that with the exception of a few rice tracts, where the buffalo may serve both purposes, dual breeds of cows have to be encouraged through animal husbandry and dairying schemes. With this end in view, the loan assistance for the purchase of milch animals will be more purposive in nature during the Third Plan and will be directed towards the fulfilment of the breeding policy. In order to promote good breeds of cows, to the extent feasible, cow's milk should be purchased by plants at the same price as buffalo milk. The percentage of the fat content should not be regarded as the sole criterion for fixing the price of milk. Although the cow's milk has a lesser fat content, it has several other special qualities on account of which it is preferred for use by children and by patients in hospitals.

Even in the case of large dairies in big cities, every attempt should be made to link such schemes with the countryside, so that dairy schemes could be directly helpful in enriching the rural economy through the development of cattle with the twin objectives of increasing milk production and supplying good animals for draught purposes. The existing smaller dairies in medium-size towns will also be oriented in this direction according to phased programmes.

31. Colonies of cattle have been established at Aarey, Haringhata and Madhavaram (Madras) to improve the sanitation of the cities and organise milk supply on more economic lines. This method of colonisation has involved considerable capital outlay and it was, therefore, considered desirable to limit the responsibility of the State to the provision of land with essential services, e.g. roads, water supply and electricity. The

during transport. These Indian carps are useful in increasing the productivity of fish ponds. Another important development has been the introduction of the common carp from South-East Asia which is a useful addition to Indian carps. These developments can lead to a substantial increase in fish supply, provided they are accompanied by improvements in organisation at the local level through Panchayats and cooperatives and in marketing.

37. The Third Plan provides for a programme of 50,000 acres of water in different States being used as demonstration fish farms. Similarly, demonstrations in the utilisation of estuarine areas will be undertaken over an area of 1500 acres and of marshy lands over an area of 2000 acres. It is proposed to stock 1200 million fry and fingerlings. Regular stocking will also be done in the river valley projects which offer considerable scope for fishery development. Programmes for the Third Plan include arrangements for clearing trees, boulders and other obstructions, establishment of nurseries, and measures for conservation of fish till it comes to full maturity. These are necessarily long-term measures and stocking undertaken in the Third Plan will yield harvest in about 15 years' time. The economic value of development on these lines is, however, apparent from work done at a few reservoirs during the Second Plan.

38. To ensure effective use of inland waters, certain improvements in organisation at the local level are essential. In the past, where water was owned by individuals, they did not have the resources to develop it. Where it belonged to Government, it was auctioned and developmental aspects did not receive the necessary attention and the fish was soon depleted. For these reasons, many ponds have already gone out of use. Panchayat Samitis and Panchayats should undertake the development of fish ponds and other inland waters as a growing local resource. They should work in close association with cooperatives through which credit and marketing facilities should be made available.

39. *Fisheries cooperatives.*—The formation and running of fisheries cooperatives is an important aspect of fisheries development during the Third Plan. There are at present about 2100 fisheries cooperatives with a total membership of about 220,000. They are mainly centred in Andhra Pradesh, Maharashtra, Gujarat, Kerala and Madras, although a few societies also exist in other States such as Mysore, Assam, Bihar and Orissa. Fisheries cooperatives function with varying degree of success and only about 800 of them can be said to have satisfactory performance. A number of factors have hampered the growth of cooperative societies, the more important these being:

(a) fishermen do not generally own boats, nets and other fishing equipments. In consequence middlemen, who provide

be greatly augmented through the use of improved techniques in all aspects of production and utilization and organisation of fishermen on cooperative lines.

REVIEW OF PROGRESS

34. In the First Plan an outlay of Rs. 2·8 crores was incurred on fisheries development. Expenditure in the Second Plan amounted to about Rs. 9 crores.

The survey of 13.34 lakh acres during the Second Plan points to the substantial fisheries resources. Additional area of about 82,000 acres was reclaimed for stocking suitable varieties of fish. An area of 16·7 lakh acres was stocked with about 600 million fry and fingerlings.

Investigations were undertaken at the Central Fisheries Technological Research Institute at Cochin with a view to improvement in the designs of fishing craft and fishing gear. In addition to the Central Offshore Fishing Station, Bombay, for exploring new fishing grounds, three similar Stations were established at Cochin, Tuticorin and Visakhapatnam. Boat-building yards were established in Gujarat, Maharashtra, Mysore, Kerala, Madras and Andhra Pradesh. About 1800 boats were mechanised. With these, fishermen could go out into the sea 15 to 20 miles distance compared to the capacity of the customary non-mechanised boat to go out to a maximum of 6 miles and as a rule only 3 miles. Six refrigerated rail wagons were introduced on an experimental basis for the transport of fresh fish from the producing centres along the coast to places like Calcutta and Delhi. As a result of these various measures the production of fish increased from 7 lakh tons to 10 lakh tons by the end of the First Plan and to 14 lakh tons by the end of the Second Plan.

PROGRAMMES FOR THE THIRD PLAN

35. Fisheries schemes in the Third Plan have been formulated with the main objective of increased production so that protein diet becomes available to the population in addition to cereals. Due consideration has been given towards effecting improvement in the condition of fishermen. Emphasis has also been placed on the development of export trade.

36. *Inland fisheries.*—The programme for inland fisheries undertaken in the First and Second Plans will be further expanded. Large-scale expansion has become possible in view of the technique of induced breeding by hormone treatment which has been successfully developed on Indian carps. This is a major development which will enable spawn and fry to be raised independently of the naturally-spawning areas. This technique will reduce the need for transporting fry and fingerlings to different areas, thereby minimising considerably mortality

equipment for preserving fish at the consumption centres have also been introduced.

As a result of programmes that are to be taken up during the Third Plan period, the production of fish is expected to increase from 14 lakh tons to 18 lakh tons. Exports of fish may go up from about Rs. 6 crores to about Rs. 12 crores. About Rs. 29 crores have been allotted for the development of fisheries in the Third Plan.

Research and Education

42. *Research*.—With the establishment of Central fisheries Research Stations for Marine Fisheries at Mandapam, and for inland fisheries at Barrackpore as also the Central deep sea fishing station at Bombay, considerable progress has been made in the study of biology of commercial species, scientific investigations on conservation and management of inland fishery resources and charting of new fishing grounds. In the Third Plan, new investigations on oceanic fisheries, oceanographic studies, high altitude fisheries, fresh water prawns, back water fisheries, etc. will be taken up. Experimental and exploratory fishing will be undertaken in four new centres.

The Central Fisheries Technological Station, Cochin has undertaken investigations on gear material and their preservation, designing of improved types of mechanised fishing crafts, storage of fish in fresh, chilled and frozen conditions, processing and utilisation of fish and other marine products, etc. These investigations will be intensified. In addition to the research schemes undertaken by the Central Stations, State Fisheries Departments will also work on local problems on fisheries.

43. *Education*.—A fisheries training institute for fisheries administrative personnel at district level has started functioning at Bombay. An institute for training operatives in fisheries at various levels will be established at Cochin. A sub-station for the training of assistant fisheries development officers and other personnel required for inland fisheries would be set up at Kaushalya Ganga near Bhubaneshwar in Orissa.

The total requirement of persons to run the different development projects in fisheries during the Third Five Year Plan is estimated at about 2100. Of these, personnel of the level of district fisheries officers and other technical officers will number about 300 and 500 respectively. The requirements of the former will mostly be met by training at the Central Institute of Fisheries Education which will be established at Bombay, while the requirements of the other field staff will be met by the expanded activities which have to be provided at the Inland Fisheries Research Station, Barrackpore, the Inland Fisheries Sub-centre in Orissa and the offishore fishing stations. As regards research and technological personnel for research institutions, it is important that adequate facilities should be available in the universities.

credit, bind fishermen to work on their boats. For allowing the use of the boat, as much as 50 per cent of net sale proceeds is recovered as charge for hire; and

(b) cooperative societies have been mainly engaged in providing credit and an adequate effort has not been made to develop production and marketing.

Revitalisation of the existing fisheries cooperatives and their further development and linking up with marketing and processing cooperatives is an important task to be carried in the Third Plan. It is proposed to work out a detailed programme for this purpose. Organisation of cooperatives for fishermen is an indispensable means for preventing exploitation by middlemen, removing the indebtedness of fishermen and increasing production.

40. *Marine fisheries.*—About two-thirds of the country's estimated fish production comes from the sea. In the Third Plan, besides intensifying existing programmes for installing engines in existing crafts and assuring supply of fishing requisites, it is proposed to introduce 4000 new mechanised crafts. The exploratory fishing programmes of the Central Deep Sea Fishing Stations at Bombay, Cochin, Tuticorin and Visakhapatnam will be expanded and additional units at Veraval, Mangalore, Paradwip and Port Blair will be established. These investigations will assist the development of a modern fishing industry. It is also proposed to operate 35 large vessels and to provide landing and berthing facilities for fishing at 16 ports.

41. Fish being a highly perishable commodity, adequate facilities for marketing are absolutely essential. Ice-cold-storage, processing and canning are necessary processes for securing a reasonable price for the catches. A beginning has already been made in the Second Plan. Freezing facilities for prawns have come up in Cochin, Mangalore and Bombay. During the Third Plan period it is proposed to have 72 ice and cold storage plants distributed in different States to facilitate movement of fish in good condition to consuming centres. In addition, freezing and canning units are expected to be established in coastal districts in Western India, specially in Kerala, Mysore and Gujarat. Experience gained in the running of refrigerated rail wagons will be utilised in developing a regular transport system between fish production and consumption centres throughout the country. About 20 new vans are proposed to be introduced on the main routes. Work in the Indo-Norwegian project in Kerala, where new boats have been designed, mechanization of boats undertaken and better gear introduced, has also brought out the need for an integrated marketing system. In this project the ice and cold storage plant has been established as the base of operations and a cooperative fishermen's sales organization is being set up. Insulated transport and

of pure tannin, 30 per cent of which still comes from abroad. In the case of medicinal plants, owing to favourable ecological situation there is considerable scope for development.

4. In productive areas in well-maintained forests, yields of about 2·75 tons per acre per annum are obtained for sal, of 4·10 tons for deodar and of 1·30 tons for chir pine. For several reasons the average yield in India is, however, extremely low. Large areas of unclassed State forests and the former private forests acquired by Government after the abolition of zamindari are understocked and require to be rehabilitated. In forests in inaccessible hilly areas a proportion of the timber is lost because of lack of adequate facilities for transportation. Large quantities of inferior woods which could be put to economic use through seasoning and preservation treatment remain only partially utilised. Customary forest rights and concessions, which are undoubtedly important, also have the effect of reducing the yield. As economic development proceeds and river valley and other projects are undertaken, to an extent forest areas are even apt to diminish. There are obvious difficulties in expanding the area under forests. In the circumstances the principle objective of forest policy must be to raise productivity progressively and to undertake cultivation of quick-growing species so as to meet the growing requirements of the economy.

Review of Progress

5. Both the First and the Second Plan put considerable emphasis on preservation processes, improvement of communications and introduction of degraded forests, establishment of new plantations, especially of fast growing species, application of modern systems of intensive forest management, better utilisation of inferior varieties by seasoning and preservation processes, improvement of communications and introduction of modern logging techniques. In 1950, the Central Board of Forestry was set up. In 1952, Government declared its forest policy, which emphasised the protective as well as productive role of forests and suggested as a desirable long-term objective that a third of the land area should be under forests. A sum of Rs. 9·5 crores was spent during the First Plan and about Rs. 19.3 crores during the Second Plan for the development of forestry. Schemes directly undertaken by the Central Government related to forest research, forest education and the preservation of wild life. Large tracts of degraded forests situated in the former zamindari estates and princely States came under Government control. Schemes for the demarcation of such areas and preparation of maps were taken up. New plantations of matchwood extending over an area of about 55,000 acres and of industrial timber over an area of 330,000 acres were undertaken during the First and Second Plans. Survey and demarcation was undertaken over about 18000 square miles,

CHAPTER XXII

FORESTS AND SOIL CONSERVATION

FORESTS

DEVELOPMENT of forest resources is an integral part of the programme for optimum land utilisation. Forests have important protective as well as productive functions. They not only supply timber, fuel, fodder and a variety of other products but also have a moderating influence against floods and erosion and help maintain soil fertility. A number of industries, such as, construction, furniture, paper, rayon, plywood, matches, resin and tanning depend on forests for supply of raw materials. Development of forestry and forest industries is also essential for raising the income of the tribal people who live in the forest areas.

2. In view of India's tropical climate, periodic monsoons, low forest productivity and predominantly agricultural economy, it has been urged that at least a third of the total land area in the country should be under forests. But as against this, the actual proportion today is only 21.8 per cent. Moreover, most of the forests are concentrated in a few States only, namely, Assam, Madhya Pradesh and Orissa and a few Union Territories. In northern India, in particular, the proportion of forest land to the total area is much lower than the all India average. There is great need not only for increasing the forest area for the country as a whole but also for more intensive development in areas which are lacking in forest wealth.

3. While the area under forests continues to be at a low level, the demand for various forest products, both for industrial use and for domestic purposes, has been steadily increasing. It is estimated that the requirements of industrial wood (including pulp material) which amount to 4.5 million tons at present, would increase to about 9.5 million tons in 1975. The demand for paper and rayon grade pulp, in particular, is likely to expand considerably with growing population, increasing literacy and rising standards of living. As new plantations take 25 to 30 years to develop, in the ordinary course production may not increase beyond 5 5 million tons by 1975, thus leaving a gap of as much as 4 million tons. Due to acute shortage of fuel wood, nearly 400 million tons of cowdung (wet weight) equivalent to 60 million tons of firewood is annualy burnt instead of being put in land as manure. The shortage of firewood is anticipated to be about 100 million tons by 1975. As regards minor produce, the present requirement of tanning materials is about 30,000 tons

9. *Promotion of methods for increased production.*—Improved logging tools and mechanical contrivances can help reduce wastage and increase the utilisation of wood resources. In hilly areas, in particular, the savings are considerable. Modern tools and other equipment employed in advanced countries have been tested and the staff of Forest Departments in several States have been trained in their use. Work on improved implements is also being undertaken at the Forest Research Institute, Dehra Dun.

10. Some of the rich forests at higher elevations in the Himalayas remain untapped or are only partially exploited. This is mainly due to their inaccessibility. There are some steep and rocky slopes where the use of cable cranes is essential. Forest roads need to be linked with trunk roads and river landings, so that the timber can be transported or floated easily. The Plan provides for the development of about 15,000 miles of forest roads.

11. *Development of minor forest produce.*—Indian forests have a large variety of minor products, there being over 3000 species, besides a number of animal products. Considerable scope for exploitation and development exists, for instance, in respect of medicinal plants, essential oils, resins, fatty oils, fats, waxes, starches, bamboos, canes, grasses, and insect products, such as, honey, lac, and bees' wax. Export possibilities also exist for certain medicinal plants, such as, Rauwolfia serpentina. Proposals for the exploitation of various forest products are provided for in the plans of States.

12. *Timber treatment.*—There are about 100 secondary species of timber which are not utilised properly at present. These secondary species can be used as a substitute for the primary timber after the necessary seasoning and preservation treatment. The Plan provides for the setting up of 27 seasoning and 3 seasoning-cum-preservation plants. It is important that high grade timber should be reserved for uses which are valuable and for which adequate substitutes are not available.

13. *Survey and demarcation.*—Large areas outside the reserved forests and those recently acquired by State have not yet been classified nor their legal status defined. Proper demarcation on the ground is essential for scientific working and rehabilitation of these areas. Survey and demarcation work is proposed to be taken up over an area of about 43,000 square miles.

Rehabilitation work on areas which were surveyed and demarcated previously, will be taken up and extended to about 600,000 acres, particularly in Uttar Pradesh, Madhya Pradesh, Madras and Mysore.

14. *Pre-investment survey of forest resources.*—The need for a comprehensive appraisal of the country's forest resources with a view to develop-

9000 miles of forest roads were built and about 400,000 acres of degraded forests were rehabilitated. Improved methods of logging were demonstrated, especially in the States of Punjab, Himachal Pradesh, Uttar Pradesh and Jammu & Kashmir.

Programmes for the Third Plan

6. In the Third Five Year Plan it is proposed not only to intensify some of the programmes initiated under the First and Second Plans but also to put special emphasis on measures which will help meet the long term requirements of the country and ensure more economic and efficient utilisation of the available forest products, including inferior timber and wood residues. The immediate objective is to increase the output through better techniques of timber extraction, to develop forest communications and to bring about better utilisation through the increased use of preservation and seasoning processes. The Plan provides an outlay of Rs. 51 crores for various development programmes in the States and Union Territories, including a sum of Rs. 6·7 crores for Central and Centrally sponsored schemes. Some of the important programmes included in the Third Plan are briefly described below.

7. *Economic plantations.*—A large scale programme of new plantations is essential for meeting the increasing requirements of industry. These plantations should comprise not only the traditional species of timber with long periods of maturity but also fast growing species with a comparatively short rotation. The programme for new plantations includes 210,000 acres for teak, 40,000 acres for bamboo, 60,000 acres for match-wood, 22,000 acres for wattle, 46,000 acres for fuel-wood including casuarina and 325,000 acres for miscellaneous plantations. An additional programme for planting 300,000 acres over the period of the Third Plan with fast growing species of industrial wood is also proposed to be taken up.

8. *Village and extension forestry.*—The importance of village and fuel plantations and of extension forestry has been frequently stressed, but the practical results gained thus far are small. Panchayat Samitis and Panchayats should be assisted to take up these programmes on a large scale, and Forest Departments should ensure that seeds and saplings are available in each area. There is considerable scope for community effort in planting trees on village common lands, along village roads, contour bunds and irrigation tanks. Individual cultivators should also be assisted in growing trees. It is estimated that an area of over 1·2 million acres will come under farm forestry during the Third Plan. Programmes for planting trees along national and State highways, canal banks and railway tracks should be intensified. Efforts in these directions can add substantially to the supply of firewood and of wood for tools and implements.

In addition, States will provide facilities for the training of about 10,000 field personnel, such as, foresters and forest guards.

18. *Nature conservation.*—Nature conservation is an important aspect of forest development and includes the protection and proper management of indigenous flora and fauna. Where fauna have been greatly depleted due to human interference, animals and birds will be re-introduced. The Plan includes a programme for the development and establishment of 5 zoological parks, 5 national parks and 10 wild life sancturies. The Delhi zoological park is also to be developed further.

19. *Amenities for forest labour.*—Forest labour is not yet properly organised. To safeguard the interests of forest labour and the tribal people from exploitation by private contractors, as far as possible it is proposed to organise them into forest labour cooperative societies and give these societies suitable concessions in the matter of working of coupes and exploitation of other produce by way of encouragement. State plans provide for schemes for housing, medical aid, water supply and primary education for forest labourers.

20. *Public cooperation.*—Public cooperation has a vital role in forest development. The contribution of the local community in village and extension forestry has been referred to earlier. Whether trees are planted by the people or by Government agencies, their care and protection can only be secured if the people as a whole are conscious of the value of trees and endeavour earnestly to preserve them. Village fuel plantations are important community assets and village communities should be helped to build them up for themselves and, progressively, greater responsibility for managing forests should be placed on Panchayat Samitis and Panchayats.

SOIL CONSERVATION

21. One of the principal reasons for low productivity in agriculture in certain parts of the country is the progressive deterioration of soil due to erosion. In irrigated areas soil deterioration has occurred on account of water logging and consequent salinity and alkalinity. It has been estimated that about 200 million acres of land, that is, almost a fourth of the country's land surface is suffering from soil erosion. It will not be possible to maintain yields of crops on dry lands, much less to increase them, if the soil is allowed to deteriorate. Effective steps, therefore, need to be taken to plan and undertake soil and moisture conservation measures on a large scale.

Review of Progress

22. The urgency of a nation-wide policy for dealing with various problems relating to soil conservation was emphasised in the First Five Year Plan. In 1953, the Ministry of Food and Agriculture set up the

ing forest-based industries such as rayon, chipboard, particle board, fibre board, etc. has been felt for some time. Until adequate and dependable supplies of raw material are established, it is difficult to promote the formation of integrated industrial units. The Third Plan includes a project for a pre-investment survey of forest resources and industries. The main object of the survey is to facilitate the formulation of a long-term programme for planting quick-growing species, for opening up forest regions in the interior and for assessing the economic prospects of forest-based industries. The pre-investment survey will also take into account the requirements of different industries over the next 15 years or more. The survey is intended to be followed up by detailed programmes for the improvement of transport facilities, setting up of integrated wood utilisation units of saw milling, board manufacture, etc. Measures taken in the light of the survey should assist in filling the gap between the availability of timber and other forest products of economic value and the demand for these products to which reference has already been made.

15. *Grazing and pasture improvement.*—In some parts of the country there is often acute shortage of fodder for cattle. There are certain hardy trees and bushes, the leaves of which have fodder value and are extensively used by local graziers for tiding over periods of scarcity. Where agriculture is precarious or where large non-arable lands exist and the people follow pastoral pursuits and maintain big herds of cattle, it is necessary to establish large pastures studded with suitable trees and shrubs of fodder value. The Plan provides for the development of about 150,000 acres of pasture and grazing lands in such areas.

16. *Forest research.*—The programme of research initiated during the Second Plan at the Forest Research Institute, Dehra Dun will be continued and further expanded. Three regional research stations are to be established for supplementing the work done at Dehra Dun. With a view to promoting the use of various species of wood available in forests in different regions, extensive studies will be undertaken at these centres on their properties, e.g., strength, durability and economic use. Investigations will also be made on factors affecting the yield of valuable products, such as, sandal, agar, etc. and the possibilities of more intensive utilisation of lesser known forest products. Experiments will be conducted on the utilisation and raising of various kinds of canes and bamboos which can be put to diverse use.

17. *Training of technical personnel.*—For the efficient implementation of different programmes of forest development, a large number of trained persons will be required. It is estimated that 480 officers and 1,520 rangers will have to be trained for State Forest Departments. It is proposed to increase the rate of admission to the officers' course from 85 to100 at the Forest College, Dehra Dun, and to the forest rangers' course from 200 to 300 at the Forest Rangers' Colleges at Dehra Dun and Coimbatore.

27. The Desert Afforestation and Research Station at Jodhpur was reorganised as a Central Arid Zone Research Institute in collaboration with UNESCO. The scope of its studies now extends to arid and semi-arid regions throughout the country. Experiments carried out at Jodhpur have emphasised the importance of pasture development and management for stabilisation of shifting sands. A scheme for pasture development was started in Rajasthan. The scheme envisages setting up of 55 paddocks of about 200 acres each on pasture improvement and management for demonstration and research purposes. About 50 paddocks in 18 extension blocks have been developed so far.

Programmes for the Third Plan

28. With experience gained during the Second Plan and larger numbers of persons trained in soil conservation, development work during the Third Plan is proposed to be stepped up considerably. An outlay of about Rs. 72 crores has been provided for the execution of various soil conservation programmes.

29. *Contour bunding and dry farming techniques.*—However much irrigation may spread in India, there will still be left an area of 140 to 150 million acres in which increased yields have to be obtained, mainly through contour bunding, soil conservation and dry farming techniques. Thus, for balanced development of the agricultural resources, it is essential that large-scale soil conservation and dry farming programmes are taken up on the basis of mass participation by the rural communities concerned. In the Third Plan, about 11 million acres will be covered by contour bunding and about 22 million acres will be benefited under dry farming techniques. In addition to contour bunding, the programmes which need special attention are rain water conservation, weed control, strip cropping and judicious use of organic manures including green manures.

30. *River valley projects.*—Afforestation of catchment areas of rivers and allied measures of land-use are essential for (i) prolonging the life of storage reservoirs of river valley projects, (ii) effective functioning of the minor irrigation tanks, (iii) moderating floods, (iv) avoidance of erosion of land, (v) improving fertility of soil, and (vi) augmenting the supply of timber and fuel. As explained in an earlier chapter, soil conservation measures in the catchment areas of Bhakra-Nangal, Domodar Valley Corporation, Hirakud and some other major river valley projects are specially urgent. Out of a total catchment area of about 37 million acres under these river valley projects, nearly 15 million acres need to be treated eventually with soil conservation measures. During the Second Plan, about 140,000 acres were covered under these measures. An allocation of Rs. 11 crores has been made in the Third Plan for extending this programme to another million acres. Emphasis has also been laid on

Central Soil Conservation Board to initiate, organise and coordinate research in soil and water conservation, to train personnel and to assist States in carrying out soil conservation programmes. A sum of about Rs. 1·6 crores was spent in the First Five Year Plan on implementing soil conservation programmes. A large part of this was utilised for contour bunding and terracing of about 700,000 acres of agricultural lands, mostly in Maharashtra and Madras States. Eight regional research-cum-demonstration centres were established for the study of problems of soil and water conservation. In addition, the Desert Afforestation and Research Station was set up at Jodhpur for undertaking the study of the desert problems.

23. In the Second Plan about Rs. 18 crores were spent on carrying out soil conservation works. Contour bunding and terracing made good progress, especially in the erstwhile Bombay State, and an area of 2 million acres was benefited. An integrated all-India Soil Conservation and Land Use Survey was also initiated. Aabout 12 million acres have been surveyed, of which about 2 million acres are in the catchment areas of river valley projects.

24. Training centres started during the First Plan for training officers at Dehra Dun and for assistants at Kotah, Bellary, Ootacamund and Hazaribagh were continued during the Second Plan. About 170 officers and 900 assistants have been trained. In addition, arrangements were made for training community development personnel and for providing refresher courses.

25. With a view to popularising dry farming techniques, 40 demonstration projects, each covering about 1000 acres and undertaken on a catchment basis were sanctioned in the latter part of the Second Plan. Work has already begun on some of these projects and these will be extended and completed during the Third Plan.

26. Research work carried out at various research centres has yielded useful results. Methods for the reclamation of shallow ravines for agricultural purposes were worked out for Gujarat ravines. Techniques developed for the economic utilisation of deep and narrow ravines for horticultural crops, forest plantations and pasture improvement have brought promising results. Experiments conducted in deep black soils have shown that contour cultivation increases the yield by 60 to 70 lbs. per acre in the case of jowar grain and about twice that much amount in the case of fodder. At Jodhpur, techniques were developed for stabilising moving sand dunes and shifting sands, and about 1800 acres of sand dunes were stabilised. Studies on pasture development have indicated that closure and rotational grazing helped to increase materially the yield of grasses.

Pradesh and Uttar Pradesh. Since the major occupation of the bulk of the population in these areas is rearing of cattle and breeding of sheep and goats, the wind erosion problem is linked with the problem of the pastoral areas. The Central Arid Zone Research Institute has taken up research in these and other related problems. A pilot project is also proposed to be undertaken for examining the methods and economics of reclaiming desert lands in a portion of the Rann of Kutch. It is proposed to bring about 100,000 acres of desert areas under suitable soil conservation measures including afforestation and pasture development in different States.

34. *Hilly areas and other wastelands.*—From the point of view of soil erosion, hilly areas, denuded forests and wastelands pose a serious problem. Soil erosion taking place in these areas has adverse effects on agriculture in the hills and in the plains. Overgrazing, shifting cultivation and indiscriminate felling of trees have led to this situation. To control soil erosion and to restore productivity for normal utilisation, afforestation and pasture development will be extended to about 700,000 acres covering hilly areas, denuded forests and wastelands.

35. *Survey, research, demonstration and training.*—The Central Soil Conservation Board has worked out an integrated programme of survey, research, demonstration and training. During the Third Plan it is proposed to survey an area of over 15 million acres, most of which lies in the catchment areas of river valley projects. The regional research-cum-demonstration centres set up by the Board for the study of regional soil erosion problems will be strengthened. These centres have been located at Dehra Dun (Himalayan region), Chandigarh (Siwalik region), Kotah (ravines in Rajasthan), Vasad (ravine lands of Gujarat), Agra (Yamuna ravines), Bellary (black soil), Ootacamund (hilly areas), Chhatra (water-shed of Kosi) and Jodhpur (desert). Two more centres, in Orissa and Andhra Pradesh, for studying the problems of red soil areas are proposed to be set up. The Central Arid Zone Research Institute will undertake research on fundamental and applied problems of the arid zones. To stabilise the drifting sands of the desert, a pasture development scheme is also in progress. Provision has also been made for improvement of shifting cultivation. There will be one main centre in Assam, with two sub-centres and a centre each in Manipur, NEFA and Tripura. Research studies on shifting cultivation will aim at developing suitable techniques of stabilised farming for conservation of soil and water and maintenance of soil productivity. Socio-economic aspects of shifting cultivation in the region will also be studied.

36. Facilities for imparting training to officers exist at Dehra Dun and those for assistants at the four training centres, namely, Ootacamund,

increasing the tempo of the programme of fringe plantations on river and canal banks as a measure to check bank erosion.

31. *Reclamation of alkaline and usar lands.*—An important cause of deterioration of irrigated lands is the rise in sub-soil water level and the development of saline (usar) and alkaline soils. Out of about 12 million acres of such lands, a third of the area is damaged by water-logging and soil salinity, another third is affected by salinity and alkalinity with low sub-soil water table, and the balance of the area is threatened by the water table rising to less than ten feet from the surface. Expansion of irrigation increases the risk of damage to soil. Provision for drainage in areas affected by water-logging is therefore essential. A target of about 200,000 acres has been proposed during the Third Plan for reclaiming waterlogged, saline and alkaline lands, mainly in Punjab, Uttar Pradesh, Mysore, Gujarat, Maharashtra, Rajasthan and Delhi. As a result of experiments conducted at the Banthra Farm near Lucknow and at other centres encouraging results have been obtained, and further studies are being undertaken.

32. *Problem of ravine lands.*—Large areas of lands along rivers such as the Yamuna, the Chambal and the Mahi and their tributaries have been badly eroded and transformed into ravines. The march of ravines is progressing unabated, resulting in loss of productive lands. About 3·5 million acres in Uttar Pradesh and about 800,000 acres each in Madhya Pradesh, Rajasthan and Gujarat are badly affected by ravine erosion. Work at research centres has emphasised the importance for the reclamation of the ravine lands by the adoption of controlled grazing, afforestation, terracing and other soil conservation measures in the catchment areas. Surveys to determine the severity of the problem in various areas and the action to be taken are, however, an essential preliminary. It is proposed to undertake the survey and preparation of topographical maps of ravine areas with a view to the formulation and execution of reclamation projects. A provision of Rs. 50 lakhs has been made for this purpose and for the survey and pilot work in connection with the reclamation of certain desert lands. During the Second plan, a small beginning was made for the reclamation of ravines, and pilot projects were set up in Madhya Pradesh and Gujarat. Programmes for the Third Plan at present provide for the reclamation of about 40,000 acres of ravine lands.

33. *Desert areas.*—Overfelling of trees, excessive grazing and improper land use have accentuated the formation of desert. The desert in India extends from the Rann of Kutch to large stretches of arid tracts to the north in Gujarat and Rajasthan. Due to the pressure of population, both human and livestock, vegetation is disappearing in the neighbouring areas, creating conditions conducive to further desert formation and destruction of fertile agricultural lands in the States of Punjab, Madhya

villages has been recommended. The cost of works to be undertaken on Government lands will be borne by the State. Works to be undertaken in individual holdings should be executed by the beneficiaries themselves under suitable technical supervision. If a work is not undertaken by the beneficiaries concerned, it may be carried out by the Government or on its behalf by the Panchayat Samiti or the Panchayat, and the cost recovered from them. Legislation broadly on these lines has been enacted in nine States, and five more States propose to undertake similar legislation in the near future.

Bellary, Kotah and Hazaribagh. The training of sub-assistants is arranged by States. In addition to regular training courses for officers and assistants, the Central Government have also provided facilities at Dehra Dun for conducting special three months' refresher course for gazetted officers and 2 to 4 weeks' short intensive training course for extension and block development officers. The additional requirements of technical personnel during the Third Plan are estimated at about 350 officers, 1700 assistants and 9000 sub-assistants. The existing facilities for training are being expanded accordingly.

37. *Administrative organisation.*—Soil conservation work has assumed great importance, both in river valleys where costly projects have to be executed and in dry areas where contour bunding and other soil conservation measures are proposed to be undertaken on a large scale. Each State requires a strong soil conservation organisation, for initiating, planning and executing soil conservation programmes. Whether it takes the form of a Department or of a Wing in an existing Department, it is essential that a full-time officer at an appropriate level should be responsible for its work and direction. The organisation should include in it personnel with requisite qualifications and training in the fields of agriculture, engineering and forestry. There is also need at the State headquarters of a co-ordination committee which includes the heads of the Departments of Agriculture, Irrigation, Forests and Soil Conservation as its members. Such a committee can assist in obtaining policy decisions expeditiously and in providing expert guidance and coordination in activities relating to soil conservation.

38. *People's participation.*—In the execution of soil conservation programmes, such as contour bunding and dry farming, the aim should be to secure on as large a scale as possible the participation of the people by encouraging owners and users of land in taking up these measures on a voluntary basis. Erosion consciousness should be aroused among cultivators so that they are willing to take up soil conservation work on their own initiative. For this, intensive educational programmes will have to be undertaken with the help of village institutions and other voluntary organisations to develop proper know-how among the farmers. As experience in several areas, notably in Maharashtra shows, mobilisation of local leadership for securing adequate and timely public participation will go a long way in speeding up soil and water conservation programmes. Panchayati Raj institutions should be able to play an increasing role in putting across the programme to the people on a mass scale.

39. *Legislation.*—For effective execution of contour bunding, soil conservation and other land improvement measures, the introduction of suitable legislation, empowering State Governments to frame soil conservation schemes for the basin of a river or a stream or for groups of

3. The problem of agricultural labourers is part of the wider problem of unemployment and under-employment in rural areas. Even though, with the development of agriculture and irrigation, there has been increase in production and in the total volume of work, this is shared among much larger numbers. Those sections of the rural population who are landless and are not actual cultivators have benefited much less than others; in some areas their conditions may have actually worsened. The basic problems of the rural economy are low income, low productivity and lack of continuous employment. To the extent these problems are solved through the more intensive programmes of development to be implemented in the Third Plan, the economic conditions and prospects of agricultural labourers should also improve. It has, however, been always realised that the various programmes for the development of the rural economy, which are undertaken in the interest of the rural population as a whole must be supplemented in several directions by special measures for assisting agricultural labourers in improving their living conditions and obtaining a fair share of the wider opportunities which are now being developed in the villages through the community development and other programmes.

4. The First Five Year Plan included proposals for the settlement of agricultural labour and protection against ejectment from homesteads. Not much progress was made in schemes for land resettlement. The Minimum Wages Act, 1948, was applied to employment in agriculture. Experience shows that levels of agricultural wages are bound up to a considerable extent with increases in levels of agricultural productivity and the greater use of money as the medium of exchange. Accordingly, it was decided that in enforcing minimum wages, the first attention should be given to low wage pockets in different States, and these should be identified.

5. In the Second Five Year Plan, in addition to programmes of development in agriculture and irrigation and the expansion of the community development programme, Rs. 200 crores were provided for the development of village and small industries. In rural programmes high priority was suggested for schemes intended to benefit the weaker sections of the population like agricultural labourers and artisans and others. The Plan also envisaged a number of special schemes for the benefit of agricultural labourers, including schemes for resettlement, grant of house-sites, formation of labour cooperatives, etc. In September 1957, the National Development Council proposed that from lands obtained through the application of agricultural ceilings and those donated in Bhoodan and Gramdan, a programme for resettling 300,000 families of landless workers should be undertaken. Legislation regarding ceilings was still in its early stages, and the scheme could not be implemented in the form proposed. However, individual States continued with the resettlement schemes

CHAPTER XXIII

AGRICULTURAL LABOUR

Review of Progress

To bring about improvements in the economic conditions of agricultural labourers and to remove the social disabilities from which they have suffered in the past are among the major tasks of planned development. The two principal problems are the place of agricultural labour in the future rural economy and provision of work. In the past the village economy was rooted in a scheme of stratification largely based on caste and occupation. As a result of various measures of social reform and the efforts made since Independence, the social handicaps associated with agricultural labourers, and with backward classes generally, have greatly diminished. At the same time, the economic problems of these sections of the population, especially the need for larger opportunities for work, have been thrown into sharper relief. It is one of the primary objects of the Five Year Plans to ensure fuller opportunities for work and a better living to all sections of the rural community and, in particular, to assist agricultural labourers and the backward classes to come up to the level of the rest. Their problems undoubtedly constitute a challenge, and the obligation rests upon the community as a whole to find satisfactory solutions for them.

2. The size of the problem of agricultural labour varies from region to region, depending on such factors as pressure of population, availability of land for cultivation, differences in the extent of irrigation and double cropping, fertility of land, cropping patterns and opportunities available for seasonal migration and for employment outside agriculture. However, the broad features can be discerned from the results of the two all-India Agricultural Labour Enquiries undertaken in 1950-51 and 1956-57 and the surveys of the Programme Evaluation Organisation. The concepts in the two Agricultural Labour Enquiries were different to some extent and the data are not wholly comparable. Generalisations for the country as a whole have also several limitations. What both Enquiries bring out is the enormous size of the problem, the widespread under-employment that exists, and the fact that increase in population has borne harshly on this section of the population. These general conclusions are also reflected in the results of bench mark surveys undertaken by the Programme Evaluation Organisation.

Agricultural production is expected to increase by about 30 per cent. About 20 million acres of land will be benefited by irrigation and 11 million acres of agricultural land will come under soil conservation.

9. In the village and small industries programme, there is a total provision of Rs. 92 crores for khadi, ambar khadi and village industries and Small scale industries and industrial estates will be extended to rural areas. All towns and villages with population exceeding 5000 and nearly 50 per cent of villages with a population range of 2000 to 5000 are expected to be electrified. If effective use is made of these facilities considerable additional employment will be created. The village and small industry programme as a whole is estimated to provide part-time employment or fuller employment for 8 million persons and whole-time employment for about 900,000 persons. Given full implementation of the Plan, these figures are by no means the limit of what can be achieved.

10. Through the extension of educational facilities to the entire age group 6–11 years and the development of other social services, some of the handicaps of the weaker sections will diminish. A village water supply programme at a total cost of Rs. 35 crores is being taken up with the object of providing good drinking water in all villages by the end of the Third Plan. The Plan includes programmes estimated to cost Rs. 114 crores for the welfare of backward classes. A considerable part of this amount will benefit agricultural workers. In the community development programme, the emphasis must always be on undertaking development which will benefit the weaker sections. Under the village housing project scheme, Rs. 5 crores have been allotted for the acquisition of land in villages for allotment as house-sites to agricultural labourers. Thus, to a very large extent it is through the effective implementation of these various programmes and ensuring that their benefits reach the agricultural labourers and the backward sections generally that the conditions will improve. In a word, the Plan itself, implemented efficiently and with close attention to its basic social and economic aims, is the largest part of the answer to the problem of agricultural labourers and the weaker sections of the rural community.

11. The plans of States provide for about Rs. 4 crores for resettlement schemes. It may be expected that when surplus lands become available as a result of the imposition of ceilings, such additional resources as are required for their settlement by landless persons and others will be made available by the States through the annual plans. In addition, at the Centre a sum of Rs. 8 crores has been allocated for resettlement schemes for landless labourers. A committee set up by the Government of India has recently surveyed lands classified as "other uncultivated lands excluding fallow lands" and "fallow lands other

which they had formulated, and a number of these were assisted by the Central Government. In some States, notably Punjab, Bombay, Andhra Pradesh and Bihar, labour cooperatives were promoted.

6. About 10,000 families were settled in Bihar on Bhoodan lands under two schemes for which the Central Government provided assistance. Assistance was also provided for developing a number of *Gramdan villages in Orissa. Of the total area of 4.4 million acres donated* as Bhoodan, about 900,000 acres have been distributed so far. Difficulties regarding the title to the lands donated and other procedural and organisational matters account for the slow progress.

7. During the Second Plan, a number of State Governments took steps to provide house-sites free or on a subsidised basis to landless agricultural labourers and protected them from forced ejectment. In Andhra Pradesh, *house-sites are granted to bona fide applicants, preference being given* to those who own no sites. In Madhya Pradesh, land for house-sites is set aside generally in the village abadi and, if there is some Government land, it is allotted free of any premium and assessment. In Madras, Government wastelands in the villages are assigned to persons without houses. Where Government lands are not available for assignment as house-sites to 'Harijans' and others, the sites on which they are actually living or some other suitable sites are acquired and assigned free of cost to those who do not own a house or a house-site. The Government of Maharashtra have directed that ordinarily the provision of house-sites should take precedence over other uses of land situated close to the village. It is further provided that house-sites required by agricultural families should be granted by the Collector to agriculturists upto two gunthas in area and up to the value of Rs. 200. In Mysore, if no Government land is available for the grant of house-sites, private land is acquired on payment of compensation and allotted to the agriculturists for house-sites. In the Punjab, schemes have been formulated under which subsidies are given to landless persons for purchase of land and for securing suitable house-sites.

PROGRAMMES IN THE THIRD PLAN

8. It is apparent from the experience of the first two Plans that while special schemes in the interest of agricultural labourers are useful, they can touch only the fringe of the problem. Ultimately, it is by achieving rapid and intensive development in the rural areas as part of the process of economic development for the country as a whole that the landless sections of the population can be substantially benefited. The Third Plan provides for large investments in the development of the rural economy. The total outlays in the public sector on agriculture, community development and irrigation will amount to over Rs. 1700 crores.

and employment, and provide greater amenities to rural areas. Reorganisation of the rural economy along cooperative lines and emphasis on the role and obligations of the community are intended not merely to raise agricultural productivity and diversify the rural economic structure but, equally, to bring about as rapidly as may be possible an integrated society in which there will be equal opportunity for every member of the community irrespective of caste or status. In other words, in the structure of the rural economy which the Five Year Plans attempt to build up, agricultural labourers will participate fully and on equal terms with others, and will achieve effective economic and social equality with the rest of the rural population. A close watch on the progress actually achieved in these directions should be maintained through special studies and evaluation and review by the Central Advisory Committee on Agricultural Labour and similar bodies proposed to be set up in the States.

than current fallows", and has identified nearly a million acres of land in blocks of over 250 acres. When blocks of less than 250 acres are surveyed by district authorities, further areas should become available. These, together with the land to be reclaimed under agricultural programmes are expected to amount to about 4 million acres. The Central Advisory Committee on Agricultural Labour recently set up by the Planning Commission visualises that efforts will be made to settle about 700,000 families of landless labourers in the course of the Third Plan over an area of 5 million acres. This goal should be kept in view and lands suitable for resettlement identified to make such a programme feasible. In this connection, it will be necessary to extend surveys of lands fit for settlement to the block and village level. Wherever there is opportunity for settlement, this should be utilised, even though only a small number of families may be benefited in each case. Where land is allotted, steps should be taken to provide credit and other assistance, so that the persons settled are able to rehabilitate themselves effectively.

12. In some ways the most significant development proposed in the Third Plan, whose benefits will go largely to agricultural labour, is the programme for undertaking works projects in rural areas which has been described earlier in the Chapter on "Employment and Manpower". Under this programme, it is hoped to provide additional wage-employment in rural areas for about 100 days in the year, specially during the slack agricultural seasons, for about 2.5 million persons by the last year of the Plan. The programme will specially concentrate on schemes for agricultural development like irrigation, flood control, land reclamation, afforestation and soil conservation, road development projects, provision of rural amenities and village housing projects. In the rural works programme, labour cooperatives and other construction organisations will have a large role. They will be expected to carry stocks of tools, obtain contracts, organise the necessary cadres and work closely with panchayat samitis and panchayats. A permanent solution to the problem of under-employment can be achieved only when scientific agriculture comes to be universally adopted and the rural economic structure is greatly strengthened and diversified. Efforts in these directions will also be intensified during the Third Plan. Meanwhile, the large-scale programme of rural works will provide considerable relief and will help to accelerate the pace of development in rural areas.

13. In a real sense, the problems of agricultural labour are to be traced to the long period of stagnation in the rural economy and the persistence of a rigid social structure largely based on caste. These basic deficiencies are being gradually removed, and the processes of social and technological change have to be hastened. Successive Five Year Plans seek to harness the natural resources of the country, increase production

4. Land utilisation at the end of the First Plan was as follows:

		million acres
gross area		806
culturable area		476
net area sown		318
area sown more than once		45
total cropped area		363
net area irrigated* :		
government canals	19·8	
private canals	3·4	
tanks	10·9	
tubewells and other wells	16·7	
other sources	5·4	
total	56·2 say	56
area irrigated more than once		7
gross area irrigated**		63

5. At the beginning of the First Plan, the area irrigated from all sources was 51·5 million acres, of which 22 million acres were irrigated from large and medium projects. It has been estimated that by the end of the Fifth Plan (1975-76), it might be possible to bring about 85 million acres (gross) under irrigation from large and medium projects including multi-purpose projects. In formulating proposals for the Third Plan, this long-range goal has been kept in view. The overall ultimate irrigation potentialities from major@ and medium irrigation projects are expected to be about 100 million acres (gross) and from minor irrigation including small tanks, tubewells, open wells, etc., about 75 million acres (gross). Major and medium schemes benefit large and extensive areas, give more assured protection in years of scarcity and also can often be designed to serve a multiplicity of purposes. Minor schemes require comparatively small outlays, yield quick results and can be executed speedily with local resources. But the protection afforded by them is liable to be substantially cut short in drought years when protection is needed most. In particular, tanks fail to store water when there is failure of rainfall in the locality. Balanced development of major and medium irrigation schemes and minor irrigation schemes is essential as they form part of a composite irrigation programme. Each area has to be served by the kind of schemes for which it is best suited, and which will give the best results at minimum cost.

*Net irrigated area is the area irrigated in a year counting the area which receives irrigation for more than one crop, once only.

**Gross irrigated area represents the total of cropped areas irrigated in a year, i.e. net irrigated area added to the area under subsequent crops irrigated during the year.

@Irrigation projects costing more than Rs. 5 crores each are classed as major schemes and those costing between Rs. 5 crores and Rs. 10 lakhs as medium schemes. Schemes costing Rs. 10 lakhs or less are classed as minor schemes, provided they do not form part of any existing major or medium scheme.

CHAPTER XXIV

IRRIGATION AND POWER

IRRIGATION and power have been among the most significant fields of development since the beginning of the First Plan. Expansion of irrigation, from large as well as small projects, is an essential condition for diversifying agriculture and increasing crop yields. The development of power is a pre-requisite for carrying out large industrial programmes. River valley projects like Bhakra-Nangal, Hirakud, Chambal, Tungabhadra, Nagarjunasagar and the D.V.C., which provide both irrigation and power, have, along with other programmes of development, a leading role in establishing higher levels of well-being in the regions served by them. Thus, large-scale development of irrigation and power, helps to re-build the agricultural economy and to pave the way for the rapid industrialisation of the country.

IRRIGATION

2. The available river water resources of the country were computed in 1950 at about 1356 million acre feet, of which it is estimated that because of physiographical conditions, only about 450 million acre feet can be used for irrigation. Up to 1951, about 76 million acre feet, *i.e.* about 17 per cent of the usable flow or 5·6 per cent of the total annual flow, had been utilised. By the end of the Second Plan, it is estimated that about 120 million acre feet representing about 27 per cent of the usable flow or 8·9 per cent of the total annual flow will be utilised. An additional 40 million acre feet are likely to be used in the Third Plan, bringing the proportion to about 36 per cent of the usable flow.

3. Substantial supplies are available from ground water sources. No inventory of these resources has been prepared so far, but a Ground Water Exploration Project was started in 1953 to carry out exploratory drillings in areas which held out promise of ground water availability, namely, inland river basins, coastal fringes, etc. Generally speaking, the Indo-Gangetic basin, the Sabarmati basin and coastal areas in Madras and Andhra Pradesh offer favourable scope for ground water development. Ground water can be utilised for irrigating areas which cannot be economically irrigated by canals, or which are susceptible to water-logging.

9. In the Second Plan, it was proposed to bring under irrigation an additional area of 12 million acres from major and medium projects. When the Plan was reviewed in 1958, this was reduced to 10·4 million acres. The additional utilisation, as now estimated by States, is expected to be 6·9 million acres (gross). As against the outlay originally envisaged for the Second Plan, the actual outlay is about Rs. 370 crores. In several States, the programmes lagged behind on account of inadequacy of technical personnel. In some cases, progress was retarded owing to short supplies of essential materials, such as steel, cement, coal, etc. Also, in the past, under pressure of local or regional demands, some projects have been commenced despite incomplete investigations and inadequate surveys, and this has resulted in these projects lingering on with consequent delay in accrual of benefits from them. Increases in wages and costs of materials have also led to a reduction in the physical achievement anticipated from the outlay. There has been an improvement in the pace of utilisation in the Second Plan as will be seen from Table 2. Larger results, however, could have been achieved if greater attention had been given to the timely excavation of field channels* and demonstration to the cultivators, in advance, of improved techniques of agriculture and the most suitable cropping pattern to be adopted on irrigation facilities becoming available. In the course of the preparation of the Third Plan, considerable emphasis has been placed on the strengthening of technical organisations and on taking such other steps as would ensure that progress during the Plan period is not hampered.

PROGRAMME FOR THE THIRD PLAN

10. It is essential to secure maximum benefits in the shortest time from the large investments that are being made on irrigation projects. It is also important to ensure that the benefits which accrue from these projects are not diminished through deterioration of land due to water-logging and inadequate drainage or other causes. Emphasis has, therefore, been given in the Third Plan to the following categories of schemes:

(1) completion of continuing schemes of the Second Plan right up to the cultivators' fields, i.e., including field channels;

(2) drainage and anti-waterlogging schemes; and

(3) medium irrigation projects.

11. The total irrigation potential remaining to be utilised at the end of the Second Plan is 3·2 million acres. During the Third Plan, additional irrigation potential of about 13·8 million acres is expected to be created from continuing schemes and 2·4 million acres from new schemes of the Third Plan. The total utilisation in the Third Plan period is

*The term "field channel" refers to a channel which conveys or distributes water from an outlet or opening in a water course for irrigation of fields.

6. *Development of irrigation.*—The progress of irrigation up to the end of the First and Second Plans and the targets for the Third Plan are shown in the Table below:

Table 1: Area irrigated

(net area in million acres)

	1950-51	1955-56	1960-61	1965-66
major and medium irrigation . .	22·0	24·9	31·0	42·5
minor irrigation	29·5	31·3	39·0	47·5
total	51·5	56·2	70·0	90·0

FIRST AND SECOND PLAN SCHEMES

7. The aggregate estimated cost of major and medium irrigation schemes included in the First and Second Plans is of the order of Rs. 1,400 crores, and on full development, they are expected to irrigate about 38 million acres. By the end of the First Plan, an outlay of Rs. 380 crores had been incurred on these schemes. The outlay on them in the Second Plan is estimated at Rs. 370 crores. In the Third Plan, these schemes will require a total outlay of about Rs. 436 crores, leaving a balance of about Rs. 214 crores for the Fourth Plan. Some of the projects, such as the Rajasthan Canal, Gandak, Ukai, Narmada, Nagarjunasagar, etc., will continue beyond the Third Plan.

8. Irrigation benefits accruing from the First and Second Plan schemes, at the end of the First Plan, and during the Second Plan are given in the Table below:

Table 2: Benefits from irrigation schemes

end of the year	potential* at channel outlets (in million acres)	gross area irrigated (in million acres)	gross area irrigated as percentage of potential at outlet	net area irrigated (in million acres)
1955-56 . .	6·5	3·1	48	2·9
1956-57 . .	7·4	4·2	58	3·4
1957-58 . .	8·2	5·8	71	4·9
1958-59 . .	9·7	6·5	67	5·9
1959-60 . .	11·5	8·3	72	7·4
1960-61 (estimated) .	13·2	10·0	76	9·0

The distribution, by States, of the ultimate benefits from major and medium irrigation schemes of the First and Second Plans, the potential expected to be created by the end of Second Plan and the corresponding utilisation is shown in Annexure I.

*Irrigation potential is the area which can be irrigated with the water made available at channel outlets.

the Second Plan, sufficient data had not been collected for preparing detailed proposals for flood control for inclusion in the Plans of States. The flood control programme was, in fact, taken up on an emergency basis, and was, therefore, treated as a Centrally sponsored programme. The flood control programme is now well under way and considerable progress has been made in surveys and investigations. In the Third Plan, therefore, flood control schemes, together with drainage, anti-waterlogging and anti-sea-erosion schemes form part of the Plans of States.

15. The importance of providing adequate drainage in irrigated areas to prevent their deterioration by rising ground water table and consequent waterlogged conditions has already been emphasised earlier. The cost of drainage works in irrigated areas in the case of continuing and new schemes has to be included in the project costs of these irrigation schemes. Waterlogging in certain parts of the country, particularly in the Punjab, has become serious, and anti-waterlogging measures such as drains, lining of irrigation channels in selected reaches, and other steps to depress the ground water table, have to be taken up in the Third Plan on an extensive scale. Similarly, anti-sea-erosion measures in certain coastal reaches, such as Kerala have to be given due attention. An outlay of Rs. 60 crores was provided in the Second Plan for flood control schemes. The actual expenditure is about Rs. 48 crores. In the Third Plan, flood control, drainage, anti-waterlogging and anti-sea-erosion schemes involving an outlay of Rs. 61 crores have been provided for in the Plans of States.

16. The programme for Irrigation in the Third Plan, which includes flood control, drainage, anti-waterlogging and anti-sea-erosion, entails a total estimated outlay of Rs. 661 crores. The distribution of this amount and the corresponding benefits under different heads are as follows:

Table 4: Programme and benefits in the Third Plan

group	estimated outlay (Rs. crores)	additional benefits (in million acres) potential	gross irrigated area
irrigation			
continuing schemes	436	13·8	11·65
new schemes	164	2·4	1·15
total	600	16·2	12·80
		net area	11·50
flood control, drainage, anti-waterlogging and anti-sea-erosion schemes	61	about 5 million acres to be benefited and 25 miles of sea coast to be protected.	
total irrigation and flood control	661		

The requirement of foreign exchange for irrigation projects in the Third Plan has been estimated at Rs. 50 crores. The particulars of important irrigation projects continuing from the First and Second Plans and those included in the Third Plan are given in Annexures IV and V.

expected to be 12·8 million acres (gross). The State-wise distribution of irrigation potential and utilisation is shown in Annexure I. In making this assessment, the States have generally assumed full utilisation within a period of five years in the case of major projects, and within two to three years in the case of medium projects, from the time water becomes available at outlets of channels. It should be possible in several projects, through closer coordination of efforts in connected fields to do better.

12. The cost of the irrigation and flood control programme during the Third Plan is Rs. 661 crores. This includes Rs. 436 crores for irrigation projects carried over from the Second Plan, Rs. 164 crores for new projects and Rs. 61 crores for flood control, drainage, anti-waterlogging and anti-sea-erosion schemes. The State-wise distribution is given in Annexures II and III. The new projects to be commenced during the Third Plan include:

(1) about 95 new medium irrigation schemes which will be of value both for agricultural and for regional development;

(2) storage schemes on the Beas in the Punjab undertaken as a result of the conclusion of The Indus Water Treaty 1960; and

(3) schemes representing the irrigation component of multi-purpose projects taken up primarily for power development, and those necessitated by irrigation programmes undertaken in neighbouring States, for instance, work on the Gandak Project in Uttar Pradesh.

13. The position in regard to phasing of expenditure on First, Second and Third Plan irrigation schemes is set out in the following Table:

Table 3: Phasing of expenditure

(Rs. crores)

	total cost	outlay before First Plan	outlay in First Plan	outlay in Second Plan	outlay for Third Plan	outlay required in Fourth Plan
First Plan schemes . .	790	80	300	270	135	5
Second Plan schemes (new) .	610	..	..	100	301	209
Third Plan schemes (new) .	364	..	..	..	164	200
total . .	1764	80	300	370	600	414

14. *Flood-control, drainage, anti-waterlogging and anti-sea-erosion schemes.*—Flood control, drainage and anti-waterlogging are closely related to irrigation, and have to be viewed together in drawing up comprehensive development plans. At the time of the preparation of

(3) completion by beneficiaries, according to a time schedule coordinated with (2) above, of field channels in every village so as to irrigate the entire area to be served by the project as water becomes available in the canals; and

(4) adoption of improved agricultural practices and new crop patterns, so that the maximum agricultural output is secured from efficient use of irrigation facilities.

Careful coordination in planning and execution between these different stages will ensure that phase by phase under each project effective results are obtained.

Financial Returns

19. Irrigation works constructed in recent years and those under construction at present, are much more expensive than works built in the past, partly on account of higher costs of labour and materials and partly on account of the more difficult and, therefore, more expensive means of making supplies available, viz., high dams, etc. For this reason, and also on account of the increased cost of maintenance and operation of old and new projects, adequate returns are not being secured. In consequence, irrigation systems are at present working at a loss in almost all States. The Second Finance Commission drew attention to the deterioration which had occurred in the net receipts from irrigation projects. The position has even worsened in recent years. Special steps to bring about substantial improvements in financial returns are, therefore, urgently called for along the following lines:

(1) speeding up utilisation of irrigation facilities created by irrigation projects;

(2) revision of water rates and introduction of compulsory water cess;

(3) recovery of betterment levy; and

(4) economy in the use of irrigation supplies.

20. Utilisation of irrigation involves efforts by a number of departments, each of which has a distinct contribution to make, e.g. Irrigation, Revenue, Agriculture, Community Development, Cooperation, etc. Besides proper phasing of the construction programme of each project, including construction of field channels, a large number of other developmental activities have to be carried out simultaneously for speeding up utilisation. These aspects are considered further later in the chapter.

17. *Soil conservation in river valley catchments.*—Large sums of money are being invested in creating storage reservoirs for irrigation and power generation. It is important that the life of these reservoirs is not unduly shortened by excessive flows of silt and sediment from the catchment areas. Also, soil cover in the catchment area has to be conserved. These considerations make it imperative that adequate soil conservation measures comprising afforestation, contour bunding, terracing, gully plugging, construction of check dams, regulation of grazing, prevention of shifting cultivation, etc., should be undertaken in these catchments. Taking only the larger river valley projects, viz. Bhakra-Nangal, D.V.C., Hirakud, Chambal and Machkund, the total catchment area for these is about 37 million acres, of which more than 15 million acres require soil conservation measures. The programme has also to be extended to other river valleys. In the projects mentioned above, an area of about 1·4 lakh acres has been covered by soil conservation programme undertaken up to the end of the Second Plan at a cost of about Rs. 1 crore. In the Third Plan, an outlay of Rs. 11 crores has been provided under "Agriculture" for soil conservation works in river valley areas and about a million acres of catchment area are expected to be covered. The programme of soil conservation is necessarily of a long-term character to be completed over four or five Plan periods. Administrative responsibility for this programme at the Centre rests with the Ministry of Food and Agriculture and the Central Water and Power Commission have set up a special unit for examining and advising on soil conservation schemes for river valley catchments received from the State Governments. The establishment of River Boards, to which reference is made later, will facilitate speedy implementation of the soil conservation programme. It will be one of their main functions to coordinate programmes of afforestation and control of soil erosion in inter-State river valleys.

18. *Phasing of projects.*—It is of utmost importance that projects should be correctly phased. This will lead to economy in construction costs and will also make it possible to secure the maximum use of irrigation facilities created, even before the actual completion of each project. It will also prevent unnecessary locking up of capital on items of work in advance of actual need. There are four aspects connected with planning for irrigation works which are interlinked and these should be appropriately coordinated from the time a project is first approved. These are:

(1) construction of the dam or barrage for storing or diverting water;

(2) construction of the canal and distributary system ending with definite and convenient points of offtake for individual villages;

works—Gang Canal in Rajasthan, Sarda Canal in U.P., Tribeni Canal in Bihar, Damodar Canal in West Bengal and Cauvery-Mettur Project in Madras. These evaluation studies suggest that while several of the indirect benefits of irrigation cannot be assessed in precise quantitative terms, among the principal benefits to be taken into account, apart from the financial returns to Government, are more extensive utilisation of land and other resources; adoption of a better cropping pattern and a shift to more valuable crops; creation of conditions favourable to fresh investment or an increase in productive investment in farm business; increase in farm productivity and stabilisation or enhancement of farm incomes; increased employment opportunities for labour; and stimulus to industry, especially processing industries, and to trade and transport. The studies also provide useful information on various aspects of irrigation development.

Utilisation of Irrigation

25. In consequence of the lags which occurred in the utilisation of irrigation during the First and Second Plans, the Planning Commission has given much attention to the subject over the past two or three years. The following are the principal measures needed for securing speedy benefits from irrigation projects:

(1) It is essential that there should be synchronisation in the programmes for the construction of head-works, canals, distributaries, water-courses and field channels so as to ensure that as far as possible the irrigation waters can be passed down to the cultivators' fields about the same time as they become available at the head-works. The synchronisation of the construction programmes, except for field channels, is the direct responsibility of the project authorities;

(2) For speedy utilisation of these irrigation facilities, development blocks should be set up over the entire area to be served by an irrigation project as soon as possible after a project has been approved;

(3) In order to eliminate delay in the excavation of water-courses and field channels, their alignment should be marked out by the project authorities on village maps, and these maps should be supplied to the district and block authorities for getting the field channels excavated by the beneficiaries in good time. It is necessary to ensure that at the same time as the canal system is ready, the excavation of field channels by the beneficiaries is also completed. Acting as agents of Government, Panchayat Samitis and Village Panchayats should be empowered to carry out the works and recover costs in case of default;

21. *Water rates.*—Water rates should ordinarily cover working expenses and debt charges and, outside scarcity areas, irrigation schemes should not involve loss to general revenues. The existing water rates in most States are relatively low. While there has been considerable increase in the value of crops produced as a result of irrigation, and maintenance costs have also greatly increased, there has not been commensurate increase in the water rates. On the whole, therefore, these require upward revision. Further, in States, where water charges are optional, there should be a compulsory water cess leviable on the entire area for which irrigation facilities are provided, irrespective of whether water is taken by cultivators or not. This itself will be a factor in inducing cultivators to make timely use of water, thereby promoting increased crop yields.

22. *Betterment levy and flood cess.*—Legislation for betterment levy has already been enacted in all States except Uttar Pradesh, West Bengal and Jammu and Kashmir. Recoveries at the prescribed rates are spread over a period of 15 to 20 years and commence two or three years after irrigation waters become available. Almost everywhere, enforcement of the legislation has lagged behind, and the actual realisations in the Second Plan are expected to be only Rs. 3·5 crores against the initial estimate of Rs. 47 crores. As regards flood-cess, the Governments of Andhra Pradesh, Assam, Bihar, Jammu and Kashmir, Kerala and Mysore have enacted the necessary legislation, while the question is under consideration in Madhya Pradesh, Maharashtra, Gujarat, Orissa, Punjab, Rajasthan, Uttar Pradesh and West Bengal. Madras does not have any serious flood problems. Promotion of necessary legislation in the remaining States and enforcement of legislation where it has already been passed, are essential steps to be taken to reach the estimate of Rs. 39 crores from betterment levy and flood cess during the Third Plan.

23. It is important that when an irrigation or a flood control project is proposed for a new area, the State authorities should place the broad outlines and advantages of the scheme before the agriculturists of that area, in particular, the structure of water rates, betterment levy, flood cess, etc., which have to be paid by the beneficiaries. Such education of public opinion is likely to result in quicker utilisation of irrigation and will also prepare the ground for acceptance of water rates and betterment levy by beneficiaries when the project materialises.

24. *Evaluation of benefits.*—While the financial return of an irrigation project is an important consideration, it does not by itself provide an adequate criterion for assessing the overall benefits of the project. In order to get an idea of the various benefits which accrue from irrigation projects, the Research Programme Committee, at the instance of the Planning Commission, initiated evaluation studies for five major irrigation

close consultation between different Departments from the earliest stage, and each Department's programme should embody within it, in respect of every important irrigation project, adequate provision for carrying out its specific responsibilities. At the district level, the Collector should co-ordinate the work of the various Departments in order to ensure speedy utilisation of irrigation facilities from irrigation schemes serving the district.

INVESTIGATION, RESEARCH AND DESIGN

27. River valley projects require elaborate investigations. For integrated development of water and land resources of the country on a planned basis, and to ensure continuity in the development of water resources, adequate information regarding technological possibilities, namely, suitable project sites, hydrological data, irrigable areas, etc. for all feasible projects in a river basin should be available in advance, so that projects can be selected properly and given appropriate priority. Master plans for the long-term development of irrigation should be prepared in each State to bring out clearly the ultimate potentialities of various irrigation and multi-purpose schemes. Although special investigation units have already been set up in almost all the States, adequate progress in the investigation and preparation of projects has not been made, even in respect of projects included in the Second Plan. It is essential that in the Third Plan there should be much greater emphasis on thorough investigation of schemes, including soil surveys of the commanded area, and completion of project reports in all important respects. For this purpose, investigation units in the States should be strengthened. Schemes, which may be proposed for consideration in the Fourth Plan by the State Governments, should be thoroughly investigated well in time, and project reports prepared for them in the course of the Third Plan itself. Certain improvements in the preparation and presentation of project reports have been recently introduced. These specify various technical, financial and other aspects which should be dealt with adequately in project reports before decisions are taken and construction is undertaken.

28. To supplement the efforts of States in preparing their master plans for irrigation, preliminary studies for suitable project sites in different river basins in the country are being carried out from contour maps by the Central Water and Power Commission. These are made available to States for comment before being finalised. Field investigations and surveys in respect of these schemes would normally have to be carried out by the State Governments, to decide which of the schemes should receive relative priority for carrying out detailed investigations and preparation of project reports. The Central Water and Power Commission have completed preliminary studies for certain river basins, *viz.* Chambal, Ramganga, Sone,

(4) A large number of other developmental activities have to be carried out simultaneously. These include soil surveys, setting up of experimental farms for determining and evolving new cropping patterns, varieties of crops, etc. and farms for demonstrating scientific irrigation practices, particularly the economical use of water. It is necessary that officials of Irrigation Departments should be well acquainted with agricultural practices and with the problems of cultivators. Arrangements should, therefore, be made to impart in-service training to them for a few months. This knowledge will assist them in improving both the preparation and the operation of irrigation schemes;

(5) Economy in the use of water is a most important consideration. Distribution of water from canals on area basis, as practised at present, is not conducive to economy in the use of water. Distribution on volumetric basis is not practicable as metered outlets are expensive, and, even if installed, are liable to be tampered with. The Agriculture Department has to advise on irrigation practices suited to different crops and conditions of cultivation and should undertake the necessary investigations in each area. The water in canals saved in this manner could be utilised for more intensive irrigation and for providing water to new areas. Intensive educational work should be undertaken by the community development organisation at the block and village levels;

(6) It is also essential for the Departments concerned to undertake advance planning in their respective fields, for instance, for the supply of improved seeds and fertilisers and development of local manurial resources, provision of larger credit and marketing facilities, establishment of warehouses and godowns and improvement of communications in the areas commanded by irrigation projects. This will make it possible for cultivators to realise optimum benefits from irrigation, thereby increasing their net income;

(7) Concessional water rates are allowed in several States in the initial two or three years of a new irrigation project. This is a useful promotional measure and helps in speedy development of irrigation.

26. To ensure that planning in the various fields mentioned above is undertaken by the Departments concerned simultaneously with the planning of construction operations by the Irrigation Department, Development Committees consisting of representatives of all the Departments concerned are being set up by State Governments. There should be

31. *River Boards.*—River basins, especially those of the larger rivers, naturally extend beyond the boundaries of individual States. In some cases, the most suitable site for harnessing the water resources of a river involving, for instance, less submergence of land or smaller cost of construction, may lie in one State, while the area receiving irrigation or power benefits may lie in another State. For integrated and economic development of water resources, arrangements for inter-State cooperation are, therefore, essential. An important aspect which has to be considered in the long term planning of water resources is that, as industrialisation advances, the requirements of water supply for industries and for the growing urban populations will constitute major problems in development. The setting up of River Boards for important river basins, as envisaged in the River Boards Act, 1956, would enable a coordinated view to be taken of the needs of a river basin as a whole, including soil conservation in the catchment area. Steps to establish River Boards for the more important rivers are being taken in consultation with the States.

32. *Public cooperation.*—Flood control, drainage, anti-waterlogging and anti-sea-erosion schemes as also certain portions of irrigation works are especially suited for people's participation. These schemes involve mostly work which does not require any great skill on the part of most of the workers. They are also generally located at convenient distances from the villages benefited by these schemes. It is important that beneficiaries should be persuaded to contribute towards these schemes by offering voluntary labour and/or money in lieu thereof. These works should be carried out in close cooperation with the local organisations, especially the Panchayat Samitis and the Village Panchayats. To the greatest extent possible, labour cooperatives should be utilised. Voluntary organisations such as the Bharat Sevak Samaj can also help, for instance, in maintaining supplies of tools, obtaining contracts from the Departments concerned, and arranging for the execution of works and for the welfare of the workers. Community development organisations have an important role in these matters. They should foster a climate which will arouse the enthusiasm of the people, enlist their participation and give them a sense of partnership in the projects. They should also educate the people in their obligations as well as in the adoption of improved methods of agriculture thereby enabling them to derive the maximum benefits from irrigation.

33. *Use of manual labour and machinery.*—The use of construction machinery on river valley projects should be viewed against the background of the large manpower resources available in the country and the urgent need for providing gainful employment. Extensive use of machinery imposes much strain on foreign exchange resources. Ordinarily, construction of projects should be carried out manually, unless resort to manual labour delays completion of the work

Tambaraparni and Vaigai rivers, etc. Studies for other important river basins are in different stages of progress and are expected to be completed during the Third Plan period.

29. *Research.*—Research in the field of irrigation and hydraulic engineering is being conducted in the Central Water and Power Research Station at Poona and fifteen other research stations in the States. These stations are engaged in research in applied engineering, on problems connected with irrigation works, hydraulics and soils, etc., as well as fundamental research. With the larger programmes of development now being undertaken, the activities of these organisations have also been expanding. The basic research carried out under the Second Plan included such problems as turbulence, cavitation in hydraulic structures; design of channels, engineering properties of soils, air entrainment in concrete, sub-soil flow, sedimentation in streams and reservoirs, river protection works, instrumentation, etc. The research programmes are coordinated by the Central Board of Irrigation and Power. In the Third Plan, the programme of irrigation research is being broadened to include, amongst others, the following new problems:

(1) utilisation of isotopes in sub-soil investigations;

(2) development of techniques in pre-cast hydraulic structures;

(3) minimising loss of head through improvement of trashracks, penstocks, etc.; and

(4) experimental methods of stress analysis in hydraulic structures; and

(5) investigation on compaction of different soils in wet conditions and standing water, with particular reference to construction of earthen dams.

An outlay of Rs. 120 lakhs has been provided in the Third Plan for the programmes of fundamental research in irrigation.

30. *Designs organisations.*—Large investments are being made on irrigation projects and it is, therefore, essential to ensure the maximum possible economies in the cost of construction by adopting improved techniques in design and construction and by proper choice of construction materials. It is recommended that every State should have a strong designs organisation, which, by working in conjunction with the research organisation, can produce the most suitable and economical designs. At the Centre, the Central Water and Power Commission has the organisation to render assistance to States in preparing designs of the more complicated structures.

It is expected that, while the availability of degree-holders in the Third Plan would be adequate, there might be a slight shortage of diploma-holders, which would be met by suitable expansion of training facilities during the first two years of the Plan. In addition, for efficient operation and maintenance of costly earthmoving equipment, it is necessary to have properly trained operators and mechanics to handle them. Arrangements have been made for the training of operators and mechanics in two Technical Training Centres set up at the project sites at Kotah (Rajasthan) and Nagarjunasagar (Andhra Pradesh) by the Central Government.

36. *Control Boards.*—Control Boards have already been set up for some of the larger projects under execution, namely, Bhakra, Chambal, Rihand, Kosi, Hirakud, Nagarjunasagar, Tungabhadra, Rajasthan Canal and Koyna. The functions of these Control Boards are to ensure the efficient and economical planning and implementation of the projects, including optimum and speedy utilisation of benefits accruing from them at different stages. Several large projects are being taken up in the Third Plan. For some of these, it would be helpful to set up Control Boards as soon as the projects are approved. This suggestion is being examined in collaboration with the States concerned. For other large projects, for which no Control Boards are set up, there should be arrangements for periodical review by the Ministry of Irrigation and Power with a view to removing bottlenecks and ensuring speedy implementation.

POWER

Sources of Energy

37. Electricity can be generated from any one of the primary sources of energy available in India: coal, lignite, water falls, uranium and thorium, oil, natural and refinery gases. Tidal power, wind power, geothermal power and solar radiations are other possible sources but their impact on electricity development in India has been insignificant so far.

38. A large proportion of the total workable reserves of coal estimated at 50,000 million tons for the entire country, is confined to Bihar and West Bengal with small outlying fields in Assam, Madhya Pradesh, Maharashtra, Orissa and Andhra Pradesh. Besides, lignite deposits estimated at about 2000 million tons are known to occur in parts of Madras, Rajasthan, Gujarat and Jammu & Kashmir. Reserves of good quality coal required for metallurgical and other industries are, however, limited thus necessitating the setting up of coal washeries. Poor quality coal with high ash content and middlings from coal washeries cannot be transported economically over long distances and is best burnt in stationary boilers of power stations. Furnace oil could be utilised in boilers of steam power stations in lieu of coal. Oil refineries are being

abnormally, or adds to its cost prohibitively. Where necessary, judicious use of machinery and equipment to assist manual labour may be resorted to. Stress should be laid on the necessity of improving the techniques of manual labour to achieve greater efficiency and speed in construction. These aspects should be considered carefully and in detail in respect of the projects included in the Third Plan.

34. *Maintenance of existing works.*—Before Independence, Irrigation Departments were primarily engaged in the maintenance and operation of existing irrigation works, as few new irrigation works were being taken up. Under the first two Plans, however, large-scale programmes in irrigation have been initiated. With this change, resulting in more attention being given to construction works than to maintenance and operation, a degree of deterioration in the standards of maintenance of irrigation channels appears to have taken place. A contributory cause for this is that financial provisions for maintenance of existing channels have not been increased in many cases to the extent justified by increase in wages for labour and the costs of materials. The cumulative effect over a period of the resulting deterioration is likely to be serious. While it is important to increase irrigation facilities by constructing new projects, it is equally important that maximum benefits should be derived from existing facilities by efficient maintenance and operation.

35. *Technical personnel.*—Adequacy of properly trained technical personnel at all levels is an essential requirement for the satisfactory implementation of irrigation and power programmes. The following Table gives details regarding employment of engineers on irrigation and power programmes at the end of Second Plan :

Table 5: Estimate of employment of technical personnel in the Second Plan

category of engineers	degree-holders	diploma-holders	total
civil	5600	15900	21500
electrical	4200	6400	10600
mechanical.	1100	1900	3000
total	10900	24200	35100

The additional requirement of engineers for the irrigation and power programmes in the Third Plan is estimated as below :

Table 6: Estimated additional requirement of technical personnel in the Third Plan

category of engineers	degree-holders	diploma-holders	total
civil	2300	6700	9000
electrical	2800	4400	7200
mechanical.	800	1100	1900
total	5900	12200	18100

with thorium in breeder reactors, so that while electricity is generated, more U-233 is produced than is burnt up in the process. According to certain tentative estimates the cost of generation of electricity in this stage is expected to be lower than in the other two stages.

42. Having regard to the fact that one ton of uranium has potentialities of producing as much electricity as 10,000 to 11,000 tons of coal, the impact of nuclear power on transport facilities is obvious. Although at present, the capital cost of nuclear stations is nearly 1½ to 2 times that of thermal power stations, threshold conditions exist for setting up of nuclear power stations in relation to coal-based power stations in areas remote from coalfields and having no other alternative economic sources of power generation. Construction and operation of nuclear devices for production of electricity require a high degree of scientific and engineering skill. It is desirable that technical personnel in the country should obtain the necessary training and experience so as to undertake a larger nuclear power programme at the appropriate time.

43. Tidal and geo-thermal power plants have been in use only to a very limited extent. Prospects of economic power generation from these sources in India are, for the present, negligible. Research on direct conversion of solar energy into electricity is being carried out in many parts of the world. Wind power plants have been in use in India for pumping water in isolated locations. Recently the Council of Scientific and Industrial Research has set up a wind power division in the National Aeronautical Laboratory in Bangalore for the purpose of making wind surveys and conducting pilot studies on a few windmills and wind behaviour. The fluctuating wind power would necessitate installation of storage batteries for obtaining continuous power. The consequent high unit cost for building wind power stations is at present an obstacle to extensive introduction of such plants for power generation.

PRESENT STAGE OF POWER DEVELOPMENT

44. The total installed generating capacity in the country at the beginning of the First Plan stood at 2·30 million kW—0·63 million kW in State-owned public utilities, 1·08 million kW in company-owned public utilities and 0·59 million kW in industrial establishments having their own power stations. During the First Plan, the aggregate installed generating capacity increased by about 49 percent, the actual addition being 1·12 million kW, as against the target of 1·40 million kW. During the Second Plan, generating capacity increased by about 67 percent from 3·42 million kW to 5·70 million kW (Annexure VI). As against the initial target of 3·48 million kW, the actual addition was 2·28 million kW. The shortfall occured mainly because of foreign exchange difficulties that arose during the early years of the Second Plan and also because of delays in the execution of some of the projects such as Bhakra—Nangal, Koyna,

located at Gauhati in Assam, Barauni in Bihar and Cambay in Gujarat in addition to those existing at Digboi, Vishakapatnam and Bombay. In order to minimise costs of carriage and to avoid strain on the transport system, it is desirable to locate steam power stations in the vicinity of collieries, washeries and refineries. In view of the high cost of power generation in diesel power stations and in view also of the need for reducing import of diesel oil, expansion of this type of generation will be confined mainly to isolated locations and small nursery schemes or for peaking purposes. Refinery, blast furnace and coke-oven gases are used for power generation in a few cases. Reserves of natural gas have also been discovered in Nahorkatiya in Assam. It is proposed to utilise this gas, amongst other things, for generation of power during the Third Plan.

39. Installation of large thermal units employing higher steam temperatures and pressures would result not only in increased thermal efficiencies but also in reduction of capital costs per kW of installed capacity. The thermal efficiencies attainable with modern plants of 30, 60, 100 and 120 MW units are of the order of 26, 29, 32 and 34 percent respectively. The capital cost per kW of installed capacity of 120 MW units is about 20 percent cheaper than for 30 MW units. In India the overall efficiency of thermal power stations in 1959-60 was 19·5 percent because many of the units were small and old. With the general adoption and operation of larger units, the overall thermal efficiency is expected to improve considerably, thus enabling more kilowatt-hours to be produced from each ton of coal utilised.

40. Hydro-electric generation is of importance as, compared to coal, oil, natural gas and nuclear fuels which have to be consumed in order to produce energy, flowing water is an inexhaustible source of energy. In 1953, the Central Water and Power Commission undertook the task of systematically assessing the total power potential of rivers in the country. The possible hydro-electric sites were located on topographical maps and on the basis of available data on rainfall, run-off and river gauging, and allowing for other uses of the waters of these rivers, such as, irrigation, flood control, navigation, etc. a total hydro-electric potential of about 41 million kW has been assessed as technically and economically feasible.

41. It has been estimated that the thorium reserves in the country are among the largest in the world and are more extensive than those of uranium. In order to utilise thorium, the nuclear power programme in India has to be carried out in three stages, which is time-consuming. The first stage will utilise natural uranium as fuel, producing power and the fissile element plutonium. The second stage will employ reactors using plutonium as fuel and thorium as fertile material, producing power and converting part of the thorium into U-233. The third stage will use U-233

component, the cost per kilowatt-hour generated, the period required for construction, impact on other allied development activities such as coal mining, washeries, irrigation, exploitation of natural gas, stimulus to the development of new technology etc. The average production costs of electricity for hydro, coal-fired and diesel power stations are in the neighbourhood of 1·2 nP, 3 nP and 25 nP per kilowatt-hour respectively. The cost of atomic generation, tentatively estimated at 3·5 to 4 nP, may be comparable to that of coal-fired power stations in areas remote from the coalfields. The foreign exchange component of coal-based power stations is two to three times that of hydro-stations, while nuclear stations require still more foreign exchange. Because of the different characteristics of the various types of power generation, optimum economy can be achieved by proper balance in the different modes of generation and by inter-connecting them as far as possible to meet the varying conditions of power demand such as base, peak and seasonal loads in a grid.

48. The expected load demand in the next few years has been the main criterion in determining the size of the power programme in the States during the Third Plan. Detailed load surveys conducted by the Central Water and Power Commission towards the end of the Second Plan indicated much higher demands than were assessed at the time of the preliminary load surveys in 1958. The former along with the proposed industrial programme have formed the basis for inclusion of generation schemes in the Third Plan. Considerable increase in irrigation pumping is envisaged in the States of Madras, Maharashtra, Punjab and Uttar Pradesh. In some areas, as in West Bengal—Bihar region industrial demands are expected to rise steeply. The electrification of the railway track between Calcutta and Kanpur and of certain other sections will increase traction demands considerably In some States, where the additions to generating capacity during the Second Plan were not significant, the power programme would have to cater for a sizeable backlog of unsatisfied demands. Annexure VIII sets out the principal generation schemes included in the Third Plan. Annexure IX gives the State-wise abstract of costs of the power programme and the benefits envisaged in the Third Plan.

Physical Benefits and Phasing

49. By the end of the Third Plan, the aggregate capacity of the plants in commission and under erection and testing will be of the order of 13·40 million kW of which 12·69 million kW are expected to be in commercial operation, representing an increase in installed generating capacity of 123 percent over the Second Plan. With the completion of this programme, per capita generation of electricity would have risen from 18 kWh in 1951, 28 kWh in 1956, 45 kWh in 1961, to about 95 kWh in 1966.

Rihand and Hirakud. To avoid conditions of severe power shortage in the early years of the Third Plan, steps were taken to provide foreign exchange for implementing the remaining power schemes of the Second Plan, which had earlier been classified as "non-core" projects. Work was also taken up on a few additional power schemes which were not originally included in the Second Plan with a view to meeting increased demands that arose in certain regions during the Second Plan. Arrangements were also made to commence preliminary works on selected Third Plan schemes during the last year of the Second Plan. Important power stations commissioned in the First and Second Plans are listed in Annexure VII.

45. The total investment in electricity utilities at the beginning of the First Plan was about Rs. 150 crores, less than half of which was in the public sector. Investment in self-generating industrial establishments was estimated at Rs. 40 crores. During the First Plan, the total outlay on power development was Rs. 302 crores—Rs. 260 crores in State-owned utilities, Rs. 32 crores in company-owned utilities and Rs. 10 crores in self-generating industrial establishments. The corresponding figures for the Second Plan are Rs. 525 crores, 460 crores, 37 crores and 28 crores respectively. The figure of Rs. 460 crores includes investment by the Damodar Valley Corporation and some State Electricity Boards from their own resources. Thus the total investment on power upto the end of the Second Plan is reckoned at Rs. 1017 crores, of which State-owned public utilities would account for Rs. 790 crores.

PERSPECTIVE OF POWER DEVELOPMENT

46. The additional generating capacity installed during the Second Plan averaged about 0·45 million kW per annum. While it is proposed to step up this programme by commissioning 1·4 million kW per year on an average during the Third Plan, the pace of development in the Fourth and subsequent Plans would be higher. Thus, by 1975-76, the aggregate installed generating capacity in the country may be of the order of 35 million kW. According to present estimates, roughly fifty percent of this capacity could be provided from hydro-electric projects and the balance mainly from thermal stations. In order to achieve these targets, new hydro-electric sites will need to be investigated speedily and works commenced in time to avail of the benefits in the subsequent Plans. Having regard to the available energy resources, nuclear power is expected to play progressively increasing part in meeting energy demands in future years.

PROGRAMME FOR THE THIRD PLAN

47. *Basic considerations and criteria.*—In deciding particular methods of power generation suited to different areas, the key factors are, the capital cost per kilowatt of installed capacity, the foreign exchange

53. The transmission network will be further strengthened and extended during the Third Plan as shown in the Table below:

Table 8: Transmission lines

at the end of	transmission lines 11 kV and above circuit miles	circuit kilometres
1955	36500	58400
1960-61	84000	134400
1965-66	150000	240000

FINANCIAL OUTLAYS

54. The estimated cost of the power programme in the public sector in the Third Plan is Rs. 1039* crores. Investment in the private sector is expected to be of the order of Rs. 50 crores. The approximate break-up of the programme in the public sector is Rs. 661 crores for hydro and thermal generating schemes, Rs. 51 crores for atomic power and about Rs. 327 crores for transmission and distribution schemes including Rs. 105 crores for rural electrification. This programme provides for power supply to the Bokaro steel plant and includes the outlay required for the 150 MW extension in the Neiveli power station. The provision of Rs. 24 crores for uranium mining, fabrication and plutonium extraction plant shown originally under "Power" in the Draft Outline, is now shown in the "Industry and Minerals" sector.

55. The total foreign exchange required for the power programme in the Third Plan is estimated at Rs. 320 crores. Experience in the Second Plan has underlined the fact that our dependence for electrical equipment on imports is a serious obstacle to rapid development of power. Even during the Third Plan, a large proportion of the machinery and equipment required will have to be imported. In addition to the completion of the first Heavy Electrical Manufacturing Plant at Bhopal and its further expansion, two other plants for manufacturing boilers, steam and hydraulic turbines and other heavy electrical equipment have been provided for in the Third Plan in the public sector. Units in the private sector will undertake further expansions in capacity for the manufacture of transformers, motors and switchgear. A substantial portion of the requirements of equipment for power projects will thus be met from indigenous production.

*Includes full provision for D.V.C. power programme and Bandel thermal station.

50. A nuclear power station is planned for construction at Tarapur near Bombay. It will consist of two reactors, each producing 150 MW of power. One of these is expected to be in commission before the end of the Third Plan and the other in the first year of the Fourth Plan. Investigations regarding a suitable site for a nuclear power station in the Delhi–Punjab–Rajasthan–Uttar Pradesh region have recently been authorised.

51. The phasing of benefits from power schemes will depend largely on availability of foreign exchange and the capacity of State Electricity Boards who are generally in charge of the execution of power projects in the public sector to implement the programme approved for the Third Plan. It is essential that detailed programmes should be worked out for the preparation of project reports, preparation of specifications and tender documents, analysis of tenders when received and placing of orders, deliveries of equipment, erection, testing and commissioning of plants, and obstacles likely to upset the scheduled programme should be anticipated and dealt with in advance. Power shortage in different regions cannot be mitigated unless a strict watch is kept on the progress of the schemes and every effort made to shorten the period of construction.

52. Although there are a number of uncertain elements at the present stage the following Table suggests the likely phasing of benefits during the Third Plan:

Table 7: Phasing of benefits

year	additions during the year (million kW)	aggregate installed generating capacity by the end of the year (million kW)
1961-62	0·60	6·30
1962-63	0·73	7·03
1963-64	1·05	8·08
1964-65	2·07	10·15
1965-66	2·54	12·69

It may be pointed out that despite the large programme of development envisaged above, owing to the rapid growth in demand, power shortages are likely to continue to exist in some regions, particularly in the early years of the Third Plan. Power development has to be a continuous process, and work has to be commenced on a series of projects which will yield benefits in subsequent Plan periods. With this in view projects such as, Beas, Punasa, Idikki and others, have been included in the Third Plan.

During the ten years 1951–61, except for traction and irrigation pumping, the other types of consumption do not show significant variations. As the growth of electric traction has not kept pace with the growth of power generation, consumption in this sector has shown a downward trend from 4.4 percent of generation in 1951 to 2.3 percent in 1960-61. The consumption in irrigation pumping has registered an increase from 2.7 to 4.2 percent. It is noteworthy that whereas the overall consumption has increased by about two and a half times, the use of electricity for irrigation pumping has increased more than four-fold since 1951, and progress is expected to continue to be rapid. Growth in electricity consumption in different sectors during the First and Second Plans is given in detail in Annexure XI. Industries consume about 61–63 percent of the total amount of electricity generated or, to put it differently about 72 percent of power sold to consumers. This underlines the importance of coordinating power programmes with industrial programmes. With continued emphasis on heavy and basic industries in the Third Plan corresponding increase in power generation has been provided for.

Rural Electrification

58. An important objective of the Third Plan is to develop efficient small-scale industries in small towns and in rural areas so as to increase employment opportunities, raise incomes and living standards and bring about a more balanced and diversified rural economy. In achieving these aims a major limiting factor is the lack of power. Where electricity is available, it becomes possible to reorganise the traditional industries and to introduce small industries based on steadily improving techniques, which are capable of meeting the new needs of the expanding rural economy. In several States, electricity is being increasingly used for irrigation pumping, and the scope for this is likely to increase rapidly. Thus, in relation to the development of the rural economy, rural electrification has a growing importance, and indeed, its value cannot be assessed only in terms of the immediate economic benefits.

59. By the end of the Second Plan, the total number of towns and villages electrified in the country is reckoned at 23,000, as against 7400 at the end of the First Plan. The Third Plan provides for an outlay of Rs. 105 crores for rural electrification. This does not include the outlay required for providing the necessary generating capacity for meeting rural loads which is included in the provision for generation. By the end of the Third Plan the number of towns and villages electrified is likely to increase by about 20,000 to about 43,000. In determining the scope of the rural electrification programme in each State, the need for

56. The growth of installed capacity and energy generated is set out in the Tables below:

Table 9: Growth of installed capacity in million kW

	1950	1955	1960-61 (estimate)	1965-66 (estimate)
state-owned public utilities . . .	0·63	1·52	3·32	9·82
company-owned public utilities . .	1·08	1·18	1·36	1·45
self-generating industrial establishments .	0·59	0·72	1·02	1·42
total	2·30	3·42	5·70	12·69

Table 10: Installed capacity by type of plant in million kW

	1950	1955	1960-61 (estimate)	1965-66 (estimate)
hydro plant	0.56	0·94	1·93	5·10
steam plant	1·59	2·27	3·46	7·08
oil plant	0·15	0·21	0·31	0·36
nuclear plant	..	..	..	0·15
total	2·30	3·42	5·70	12·69

Table 11: Growth of energy generated in million kWh

	1950	1955	1960-61 (estimate)	1965-66 (estimate)
state-owned public utilities . . .	2104	4573	11250	34500
company-owned public utilities . .	3003	4019	5750	6500
self-generating industrial establishments .	1468	2185	2850	4000
total	6575	10777	19850	45000

Pattern of Consumption

57. Annexure X gives the pattern of consumption by different classes of consumers during the period 1951-61. The range of variation in this period as also the anticipated consumption in 1965-66 is given in the Table below:

Table 12: Pattern of utilisation

category	anticipated consumption in 1965-66 (million kWh)	percent of total generation	
		1965-66	range of variation during 1951-61
domestic or residential light and small power	3400	7·6	7·5 to 8·0
commercial light and small power . .	1900	4·2	4·2 to 4·8
industrial power	28400	63·1	61·3 to 62·9
traction	1800	4·0	2·3 to 4·4
public lighting	400	0·9	0·9 to 1·0
irrigation	1900	4·2	2·4 to 4·2
public water works and sewage pumping	900	2·0	2·3 to 2·8
transmission losses, consumption in auxiliaries etc.	6300	14·0	14·4 to 16·3
total . . .	45000	100·0	

to improving the load factor it is essential that different types of economic activities in each district requiring the use of power should be developed in a coordinated manner. This object can be secured through a carefully formulated development programme for each area covering activities in different fields of development such as minor irrigation, credit and service facilities for equipment, improved seeds and village and small industries, so that rural electrification makes the maximum contribution possible to the increase of agricultural and industrial production. There should be forward planning for rural electrification over a period of two or more years ahead of taking up the work so that simultaneous action is initiated in other sectors also.

63. To facilitate the drawing up of definite schemes for the utilisation of power as part of the district development plan, State Electricity Boards should indicate in advance to the district agencies concerned, their estimates of the amount of power likely to be available for rural areas and small towns during the Third Plan, year by year. It has been recommended to States that, in every district where electric facilities exist or are likely to be available small committees should be set up to plan and advise on rural development programmes. These programmes should be worked out in sufficient detail and with the necessary phasing in terms of limited areas, such as a small town and its neighbourhood or a group of villages which have a common source of power and can, therefore, develop on the basis of a well-conceived economic programme. These district plans should be implemented as part of the State plan so that the development of rural electrification keeps in step with the programme for additional generating capacity.

64. Dispersal of industries in rural areas, which is discussed elsewhere in this Report, presupposes availability of power. There should be a close link between schemes for the development of village and small industries and the programme for generation and distribution of power. Similar coordination is called for in respect of minor irrigation schemes which require electricity for pumping.

65. Several aspects of rural electrification, such as those relating to the adequacy of power supply for rural loads, rates for supply and the role of Panchayat Samitis and village panchayats in distribution of electricity are being studied further.

PROBLEMS OF COORDINATED DEVELOPMENT OF POWER

66. The Electricity (Supply) Act, 1948, laid down that a sound, adequate and uniform national power policy should be developed, coordinating the activities of planning agencies in relation to the control and utilisation of national power resources. This calls for exploitation

balance between increase in generating capacity and extensions in transmission, distribution and rural electrification has been kept in view. Much larger outlays and more rapid development in rural electrification are envisaged for the Fourth and Fifth Plans.

60. The following Table gives the distribution of towns and villages in terms of population range, numbers electrified during different Plan periods, and those expected to be electrified by the end of the Third Plan.

Table 13: Towns and villages electrified

population range	total number according to 1951 census	number electrified by March, 1951	number electrified by March, 1956	number electrified by March, 1961 (estimate)	number electrified by March, 1966 (estimate)
over 100000 .	73	49	73	73	73
50000 to 100000 .	111	88	111	111	111
20000 to 50000 .	401	240	366	399	401
10000 to 20000 .	856	260	350	756	856
5000 to 10000 .	3101	258	1200	1800	3101
less than 5000 .	556565	2792	5300	19861	38458
total .	561107	3687	7400	23000	43000

It will be seen that by the end of the Third Plan all towns and villages with population exceeding 5000 may be expected to be electrified. As regards villages with a population range of 2000 to 5000, it is envisaged that nearly 50 percent that is 10,000 villages will receive the benefits of electricity.

61. There are a number of isolated areas where small hydro plants of 10 to 100 kW each can be set up at modest cost. Small hydro units upto 100 kW capacity are now being manufactured in the country. In the long run, they will be more economical than diesel-alternator sets and relatively easy to maintain, and will not involve foreign exchange for their procurement or operation. A cell has been set up in the Central Water and Power Commission for initiating and assisting in field surveys and in the installation of such plants. This aspect of power development is of special importance in hill areas and suitable programmes should be formulated.

62. Rural extensions of electricity become relatively uneconomic mainly because of distances separating individual villages, the low level of power consumption and the seasonal character of the requirements of power specially in agriculture. Consequently the load factor is low and the available generating capacity is not fully utilised. With a view

FINANCIAL ASPECTS

69. In accordance with the requirements of the Electricity (Supply) Act, 1948, autonomous Electricity Boards have been set up in all the States. These Boards are charged with the general duty of promoting the coordinated development of the generation, supply and distribution of electricity within the State in the most efficient and economical manner, with particular reference to such development in areas not for the time being served by any licensee.

70. It is essential that electricity undertakings in the public sector should earn reasonable surpluses and provide resources for financing future development. On account of the capital intensive nature of power development and the rapid growth in demand, large investments will be required in the public sector.

71. The Second Finance Commission referred to the unsatisfactory financial results in the working of electricity undertakings and emphasised that the State Governments should take adequate steps to ensure that Electricity Boards were able to meet the interest charges on the outstanding loans due to the States. A recent review of the finances of the various Electricity Boards shows that there has been no improvement in the position. The following are the principal steps to be undertaken for bringing about substantial improvement in the financial position of the State Electricity Boards :

(1) selection of the most economical projects for power generation;
(2) achieving the utmost economy in construction costs;
(3) phasing of projects in such a way as to reduce the lag between availability of benefits and their utilisation;
(4) maximum utilisation of the existing generating capacity by building up loads so as to improve the plant and load factors;
(5) operation of power stations at the highest efficiency by measures such as effecting fuel economies, reduction of losses etc.;
(6) inter-connected operation with grids in the adjoining States, and
(7) readjustments in tariffs and electricity duties.

It has already been suggested to the States that these aspects should receive special consideration and steps should be taken to augment the revenues.

of the natural resources in the most economical manner for the benefit of the entire region regardless of State boundaries. Thus, steam power stations should be sited near collieries, washeries and oil refineries. The cheapest hydro sites in any river basin should be harnessed in an appropriate order of priority. Nuclear power stations should be located in regions where other resources of energy are inadequate or expensive. All power stations should be inter-connected to form State, zonal or super-grids, so that the energy is pooled and used to the best advantage of the region. Interconnected operation of power stations and power systems will improve the performance of electricity supply undertakings by raising the load factor, reducing the requirements of stand-by machinery and enabling the efficient operation of the available plant.

67. There has been inter-State collaboration in the past in the execution of projects such as Bhakra-Nangal, Machkund, Tungabhadra, Chambal and others. Such cooperation needs to be further extended so that power generation may be undertaken on a regional or a zonal basis and not merely to meet demands within one State. This will also pave the way for eliminating the disparities in electricity tariffs in neighbouring States. Also, in the absence of the zonal approach there is a danger of large energy resources concentrated in some States remaining unutilised, either because of the inability of the State Governments to finance the project from their own resources or because of the power demand in the State not being sufficient to call for this development immediately. Problems relating to planning and construction of generating stations, which serve more than one State, are being examined.

68. Studies are being undertaken by the Central Water and Power Commission for the establishment of a super-grid in the Southern region, linking up Andhra Pradesh, Mysore, Madras and Kerala power systems. Meanwhile, the construction of 220 kV inter-State link lines designed to provide immediate facilities for interchange of power to a limited extent between the States is being taken up. During the Third Plan, power systems in Maharashtra and Gujarat will get inter-connected as also the Chambal grid of Rajasthan with the Satpura power system of Madhya Pradesh. Other inter-State links which should be considered are: the Rihand system in Uttar Pradesh with the Amarkantak–Korba system in Madhya Pradesh and the latter with the Hirakud system in Orissa, Ganga grid of Uttar Pradesh with the Delhi-Punjab system, and the Sharavathy system in Mysore with the Koyna system in Maharashtra. A special unit in the Central Water and Power Commission is being set up for undertaking studies and planning of regional super-grids in association with State Electricity Boards and other electricity supply undertakings.

consumers ensured. As a result of the training and with the help of hot line tools and equipment, hot line maintenance techniques have now been introduced in most of the power systems in the country.

77. Standardisation of equipment is another aspect which deserves further study in the Third Plan. Standardisation will result in quicker execution of projects, economy in construction costs and lowering of maintenance expenditure. The Central Water and Power Commission have already worked out a manual of construction of rural extensions. A similar approach is proposed to be adopted for thermal power stations,

72. *Investigations of hydro-electric projects.*—Hydro-electric projects require extensive investigations. There has been a paucity of fully investigated projects which has hampered the more rapid development of this source of cheap power. In several States separate investigating units have already been set up. But the volume of work remaining to be done is large. These units should be strengthened so that greater attention can be given to this aspect in the Third Plan. A programme for investigating 64 specific hydro sites, with a potential of 12 million kW, has been drawn up and it is necessary to devote special attention to it. The total cost of investigating these schemes is estimated at Rs. 13 crores with a foreign exchange component of Rs. 1.13 crores. Assistance has already been secured to cover the foreign exchange requirements of this programme.

73. *Load surveys.*—A systematic survey of prospective loads in the various regions and their periodic review should be conducted by State Electricity Boards and the Central Water and Power Commission. This is important for advance planning of generating capacity during successive Plan periods. Provision has been made in the Plan for the continuance of the load survey directorate in the Central Water and Power Commission.

74. *Research.*—Research on problems of generation, transmission and distribution will be carried out in the Power Research Institute established at Bangalore. The problems to be investigated include lightning studies on transmission lines, development of indigenous insulating materials, development and manufacture of simple machines, appliances and certain instruments, cable characteristics, power system studies on the network analyser etc. A switchgear testing station is being set up at Bhopal for testing and developing designs of switchgear. This station will undertake testing of switchgear manufactured by the public as also the private sector.

75. *Design and construction.*—The need has been felt for setting up a specialist organisation to plan, design and construct large hydro and thermal stations which are at present being done through foreign consultants. This will not only train personnel for detailed technical work but will also save foreign exchange. A unit for this purpose is being set up within the Central Water and Power Commission.

76. *Other aspects.*—There are also a few other aspects of power programme which require continued attention in the Third Plan. Centres for hot line crew training, that is training of electrical technicians in the maintenance of live extra high tension transmission lines were set up at Bangalore and Ganguwal during the Second Plan. Insulators can be cleaned, damaged insulators replaced, conductors jointed and supports transplanted without shutting down the line and continuous supply to

ANNEXURE II

Abstract of estimated cost of major and medium irrigation projects and outlays on them in the Third Plan

(referred to in paragraph 12)

(Rs. lakhs)

State	estimated cost of First and Second Plan schemes	schemes continuing from First and Second Plans into Third Plan: estimated cost	schemes continuing from First and Second Plans into Third Plan: carry-over from Second Plan	schemes continuing from First and Second Plans into Third Plan: outlay for Third Plan	new schemes of Third Plan: estimated cost	new schemes of Third Plan: outlay in Third Plan	total provision in Third Plan for continuing and new schemes (col. 5+ col. 7)
1	2	3	4	5	6	7	8
1 Andhra Pradesh	16536	13941	6745	6548	1842	832	7380
2 Assam	170	..	..	..	277	228	228
3 Bihar	10743	9094	7118	4712	3144	1445	6157
4 Gujarat	17411	17267	12098	5014	110	110	5124
5 Jammu and Kashmir	1529	1285	1141	556	130	44	600
6 Kerala	2635	2262	378	378	2150	764	1142
7 Madhya Pradesh	8860	8402	5097	3600	2364	560	4160
8 Madras	6086	4602	2150	2150	689	592	2742
9 Maharashtra	10438	10360	6637	5034	3174	1570	6604
10 Mysore	10853	10328	3897	3341	3757	725	4066
11 Orissa	10226*	10184*	2657	1911	807	230	2141
12 Punjab	11424	10193	1348	904	4882	1300	2204
13 Rajasthan	14074	13987	8069	5770	6450	2740	8510
14 Uttar Pradesh	8966	6938	4109	2422	4024	2749	5171
15 West Bengal	8407	8104	2646	1206	749	686	1892
16 Union Territories	10	10	10	10	..	..	10
17 Central Schemes	..	..	..	..	1803†	1803†	1803†
total	138368	126957	64100	43556	36352	16378	59934

*Includes cost of Hirakud Stage I (Power portion)

†Includes Rs. 1000 lakhs for supplying water to Bokaro Steel Plant and other industries.

ANNEXURE I

Abstract of benefits anticipated from major and medium irrigation projects

(referred to in paragraphs 8 and 11)

('000 acres) gross area

State	irrigation on full development from First and Second Plan schemes	First and Second Plan schemes				new schemes of Third Plan		total from continuing schemes and new schemes of Third Plan to end of Third Plan		additional benefits in Third Plan	
		potential created to end of Second Plan	utilisation to end of Second Plan	potential to end of Third Plan	utilisation to end of Third Plan	*potential* to end of Third Plan	*utilisation* to end of Third Plan	potential (col. 5+7)	utilisation (col. 6+8)	potential (col. 9-3)	utilisation (col. 10-4)
1	2	3	4	5	6	7	8	9	10	11	12
1 Andhra Pradesh	3720	830	736	3361	2159	134	134	3495	2293	2665	1557
2 Assam	..	..	..	..	..	88	79	88	79	88	79
3 Bihar	5569	915	720	3192	2402	482	318	3674	2720	2759	2000
4 Gujarat	3809	640	227	1716	1091	..	..	1716	1091	1076	864
5 Jammu and Kashmir	163	5	5	55	32	11	11	66	43	61	38
6 Kerala	555	358	358	527	527	86	86	613	613	255	255
7 Madhya Pradesh	2242	95	75	1365	905	40	20	1405	925	1310	850
8 Madras	890	611	581	791	789	33	33	824	822	213	241
9 Maharashtra	1248	233	105	999	713	353	100	1352	813	1119	708
10 Mysore	1480	707	324	1348	1173	52	27	1400	1200	693	876
11 Orissa	2615	1000	720	2287	1666	..	..	2287	1666	1287	946
12 Punjab	4351	3307	2957	4157	4058	200	200	4357	4258	1050	1301
13 Rajasthan	3666	734	618	2357	1754	25	9	2382	1763	1648	1145
14 Uttar Pradesh	4262	2118	1475	2800	2423	912	98	3712	2521	1594	1042
15 West Bengal	2990	1690	1084	20[illegible]1	1936	32	32	2103	1968	413	884
total	37560	13243	9989	27026	21628	2448	1147	29474	22775	16231	12786

Additional utilisation in Third Plan from the continuing schemes of First and Second Plans (col. 6- col. 4)=11,639,000 acres.

ANNEXURE IV

Multipurpose and major irrigation schemes—continuing from First and Second Plans into Third Plan

(referred to in paragraph 16)

name of scheme and State	total cost (irrigation portion only) (Rs. lakhs)	outlay for Third Plan (Rs. lakhs)	utilisation ('000 acres) gross area: on completion	to end of Second Plan	to end of Third Plan
1	2	3	4	5	6
1 Bagh (Maharashtra)	610	120	60	..	2
2 Banas (Gujarat)	827	605	110	..	59
3 Banas (Rajasthan)	776	150	200	..	..
4 Barna (Madhya Pradesh)	552	200	173	..	..
5 Bhadra** (Mysore)	3193	1310	245	32	182
6 Bhakra Nangal** (Punjab and Rajasthan)	10189	419	3604	2550	3604
7 Chambal (Stage I and II) (Rajasthan and Madhya Pradesh)	5485	1703	1400	60	800
8 Damodar Valley** (West Bengal)	3468	116	1273	610	1023
9 Gandak** (Bihar and Uttar Pradesh)†	4945	3000	3138	..	300
10 Ghataprabha left bank canal (Stage I and II) (Mysore)	1863	572	298	53	180
11 Girna (Maharashtra)	865	519	143	..	116
12 Hirakud **(Stage I) including Mahanadi Delta (Orissa)	9334*	1200	2158	710	1337
13 Itiadoh (Maharashtra)	692	200	75	..	1
14 Kadam (Andhra Pradesh)	601	90	75	25	75
15 Kakrapar canal (Lower Tapi) (Gujarat)	1870	400	562	50	296
16 Kangsabati project (West Bengal)	2526	807	950	..	250
17 K. C. canal (Andhra Pradesh)	659	100	346	230	346
18 Khadakwasla (Maharashtra)	1055	596	43	..	43
19 Kosi (Bihar)	2482	1200	1397	..	900
20 Mahi (Stage I and II) (Gujarat and Rajasthan)	4178	876	751	29	214
21 Malampuzha (Kerala)	532	31	109	95	109
22 Matatila dam (Uttar Pradesh)	1283	272	413	220	370
23 Mayurakshi (West Bengal)	2015	210	720	462	580
24 Mula (Maharashtra)	1500	600	162	..	8
25 Nagarjunasagar** (Andhra Pradesh)	9112	5000	2060	..	900
26 Narmada (Broach) (Gujarat)	4309	1200	963	..	..
27 Parambikulam project ** (Madras)	2487	2112	240	..	150
28 Purna (Maharashtra)	1284	861	152	..	94

ANNEXURE III

Abstract of estimated cost and outlays on flood-control, drainage, anti-waterlogging and anti-sea-erosion schemes

(referred to in paragraph 12)

(Rs. lakhs)

State	schemes continuing from First and Second Plans into Third Plan			new schemes of Third Plan		total provision in Third Plan for continuing and new schemes (col. 4+ col. 6)
	estimated cost	carry-over from Second Plan	outlay for Third Plan	estimated cost	outlay in Third Plan	
1	2	3	4	5	6	7
1 Andhra Pradesh	195	35	35	210	208	243
2 Assam	436	115	115	507	385	500
3 Bihar	2532	700	700	291	200	900
4 Gujarat	60	50	50	..	..	50
5 Jammu and Kashmir	1060	855	855	45	45	900
6 Kerala	302	71	71	431	350	421
7 Madhya Pradesh	235	9	9	11	11	20
8 Madras	..	..	..	..	..	..
9 Maharashtra	..	..	..	30	30	30
10 Mysore	..	..	..	..	..	..
11 Orissa	74	48	48	300	202	250
12 Punjab	770	432	432	2216	1069	1501
13 Rajasthan	110	90	90	..	..	90
14 Uttar Pradesh	568	56	56	602	519	575
15 West Bengal	2305	84	84	847	431	515
16 Union Territories	79	69	69	164	68	137
total	8726	2614	2614	5654	3518	6132

ANNEXURE V

New multipurpose and major irrigation schemes of Third Plan

(referred to in paragraph 16)

name of scheme	total cost (irrigation portion only) (Rs. lakhs)	outlay for Third Plan (Rs. lakhs)	utilisation ('000 acres) gross area: on completion	utilisation ('000 acres) gross area: to end of Third Plan
1	2	3	4	5
1 Beas** (Punjab and Rajasthan) . .	11743	3700	2630	..
2 Bhima lift irrigation scheme (Maharashtra)	946	78	100	..
3 Biragobindpur (Orissa) . . .	507	150	178	..
4 Damodar Valley** (West Bengal)	664	575	*	*
5 Harangi and/or Kambadakada (Mysore) . . .	1050 } 170 }	200	105	..
6 Hasdeo** (Madhya Pradesh) . .	1600	150	300	..
7 Kallada (Kerala)	840	150	107	..
8 Kosi western canal and extension in eastern canals (Bihar)	1700	450	1149	150
9 Koyna irrigation scheme (Maharashtra)	950	275	93	..
10 Malaprabha (Mysore) . . .	2000	300	500	..
11 Sarju canal (Uttar Pradesh) . . .	1078	200	418	..
12 Vamsadhara and/or Pochampad (Andhra Pradesh) . .	1450 } 1525 }	400	357 } 360 }	115

*Extension and improvement works.
**Multipurpose project.

Note : The question of inclusion of Upper Krishna Project (Mysore) in the Third Plan is under consideration.

1	2	3	4	5	6
29 Rajasthan canal (Rajasthan)	6647	3800	1684	..	284
30 Ramganga project** (Uttar Pradesh)	3455	1600	1705	..	175
31 Ujh dam or Tawi project (Jammu and Kashmir)	900	332	62	..	..
32 Sarda sagar (Stage II) (Uttar Pradesh)	636	169	185	40	105
33 Shetrunji (Gujarat)	674	373	86	..	26
34 Sirhind feeder (Punjab)	670	10	‡	‡	‡
35 Sone project (Bihar)	2069	1200	307	50	150
36 Tawa** (Madhya Pradesh)	2184	1000	787	..	25
37 Tungabhadra **(Andhra Pradesh and Mysore)	4453	513	843	365	815
38 Tungabhadra high level canal (Stage I) (Andhra Pradesh and Mysore)	1300	1040	187	..	168
39 Ukai project** (Gujarat)	2897	700	392	..	..
40 Vir dam (Maharashtra)	541	278	66	..	61
41 Western Jamuna Canal Remodelling (Punjab)	534	150	555	354	555

*Includes estimated cost of Hirakud Stage I (Power).
**Multipurpose project.
‡This project will augment supplies under Bhakra canal and Sirhind canal systems.
†It is a new scheme of III Plan so far as U.P. is concerned.

ANNEXURE VII

Principal power stations commissioned during the First and Second Plans

(referred to in paragraph 44)

	name of the scheme	installed capacity commissioned in kW
	plant commissioned during First Plan	
1	Nizamsagar hydro-electric scheme (Andhra Pradesh)	15000
2	Machkund hydro-electric project (Andhra Pradesh and Orissa)	34000
3	Sindri thermal station (Bihar)	80000
4	Bokaro thermal station (D.V.C.)	172500
5	Utran thermal station (Gujarat)	22500
6	Ahmedabad electric supply extension (private sector-Gujarat).	60000
7	Sengulam power station (Kerala)	48000
8	Chandni thermal station (Madhya Pradesh)	17000
9	Indore thermal station extension (Madhya Pradesh)	13000
10	Moyar power house (Madras)	36000
11	Pykara power house (Madras)	27200
12	Madras plant extensions (Madras)	30000
13	Khaperkheda thermal station (Maharashtra)	30000
14	Chola power station (Maharashtra)	78000
15	Ballarshah thermal station (Maharashtra)	7750
16	Bhira hydro-electric scheme (Maharashtra)	22000
17	Jog power station (Mysore)	72000
18	Nangal power house (Punjab)	48000
19	Kanpur thermal station (Uttar Pradesh)	15000
20	Pathri hydro-electric scheme (Uttar Pradesh)	20400
21	Sarda hydro-electric scheme (Uttar Pradesh)	41400
22	Calcutta electric supply corporation extension (West Bengal)	30000
23	Delhi thermal station (Delhi)	20000
	plant commissioned during Second Plan	
1	Machkund hydro-electric scheme (Andhra Pradesh and Orissa)	81000
2	Tungabhadra hydro-electric project (Andhra Pradesh and Mysore)	36000
3	Ramagundam thermal station (Andhra Pradesh)	37500
4	Umtru hydro-electric scheme (Assam)	8400
5	Maithon hydro-electric scheme (D.V.C.)	60000
6	Panchet hydro-electric scheme (D.V.C.)	40000
7	Bokaro thermal station extension (D.V.C.)	82500
8	Durgapur thermal station (D.V.C.)	165000
9	Ahmedabad thermal station extension (private sector—Gujarat)	15000
10	Utran thermal station (Gujarat)	45000
11	Poringalkuthu hydro-electric project (Kerala)	32000
12	Neriamangalam hydro-electric project (Kerala)	45000
13	Korba thermal station (Madhya Pradesh)	90000
14	Gandhisagar dam power station (Madhya Pradesh and Rajasthan)	69000
15	Bhilai steel plant power station (Madhya Pradesh)	25000

ANNEXURE VI

Growth of installed generating capacity and generation during First and Second Plans

(referred to in paragraph 44)

particulars	1950*	1955*	% increase over 1950 (First Plan)	1960-61** (estimate)	% increase over 1955 (Second Plan)
A *utilities (public and private)*					
1 *hydro plant*					
i installed generating capacity in MW	559·3	939·5	68·0	1932·0	106
ii electricity generated (in million kWh)	2519·8	3742·2	49·0	7850·0	110
iii kWh generated per kW of installed generating capacity	4510	4000	..	4070	..
2 *steam plant*					
i installed generating capacity in MW	1004·4	1546·8	54·0	2439·0	57·7
ii electricity generated (in million kWh)	2387·2	4618·9	93·3	8790·0	90·5
iii kWh generated per kW of installed generating capacity	2380	3000	..	3600	..
3 *oil plant*					
i installed generating capacity in MW	148·8	208·5	40·2	310·6	49·0
ii electricity generated (in million kWh)	199·7	231·3	15·9	360·0	55·7
iii kWh generated per kW of installed generating capacity	1340	1110	..	1160	..
B. *self-generating industrial establishments*					
i installed generating capacity in MW	587·8	723·5	23·1	1015·0	40·3
ii electricity generated (in million kWh)	1467·8	2184·8	49·0	2850·0	30·5
iii kWh generated per kW of installed generating capacity	2500	3040	..	2810	..
total (A+B)					
i installed generating capacity in MW.	2300·3	3418·3	48·5	5696·6	66·6
ii electricity generated (in million kWh).	6574·5	10777·2	64·0	19850·0	84·2
iii kWh generated per kW of installed generating capacity.	2860	3140	..	3490	..

*Figures relate to calendar year.

**Figures relate to 1st April, 1960—31st March, 1961.

Note : Installed generating capacity is given as at the end of the year and the figures for electricity generation for the year.

ANNEXURE VIII

Principal generation schemes included in the Third Plan with benefit potential

(referred to in paragraph 48)

name of the scheme	total installed capacity in kW
continuing schemes	
1 Tungabhadra hydro-electric project stage II (Andhra Pradesh and Mysore)	36000
2 Nellore thermal station (Andhra Pradesh)	30000
3 Upper Sileru hydro-electric project (Andhra Pradesh)	120000
4 Umiam hydro-electric project stage I (Assam)	36000
5 Barauni thermal station (Bihar)	30000
6 Pathratu thermal station (Bihar)	100000
7 Chandrapura thermal station (D.V.C.)	280000
8 Ahmedabad thermal station extension (private sector-Gujarat)	30000
9 Panniar hydro-electric project (Kerala)	30000
10 Sholayar hydro-electric project (Kerala)	54000
11 Gandhisagar dam power station IV unit (Madhya Pradesh and Rajasthan)	23000
12 Amarkantak thermal station (Madhya Pradesh)	60000
13 Neiveli lignite power station (Madras)	250000
14 Kundah hydro-electric project (Madras)	35000
15 Koyna hydro-electric project stage I (Maharashtra)	240000
16 Purna hydro-electric project (Maharashtra)	15000
17 Bhadra hydro-electric project (Mysore)	33200
18 Tungabhadra left bank power house (Mysore)	18000
19 Sharavathy hydro-electric project stage I (Mysore)	178200
20 Hirakud hydro-electric project (Orissa)	147000
21 Bhakra-Nangal project (Punjab and Rajasthan)	164000
22 Rana Pratapsagar dam power house (Rajasthan and Madhya Pradesh)	128000
23 Rihand hydro-electric project (Uttar Pradesh)	250000
24 Kanpur thermal station extension (Uttar Pradesh)	15000
25 Harduaganj thermal station (Uttar Pradesh)	60000
26 Matatila hydro-electric project (Uttar Pradesh)	30000
27 Yamuna hydro-electric project (Uttar Pradesh)	320000
28 Ramganga hydro-electric project (Uttar Pradesh)	127500
29 Jaldhaka hydro-electric project (West Bengal)	18000
30 Durgapur coke-oven plant power house extension (West Bengal)	150000
31 Delhi thermal station extension (Delhi)	30000
new schemes	
1 Kothagudem thermal station (Andhra Pradesh)	120000
2 Ramagundam thermal station extension (Andhra Pradesh)	60000
3 Nagarjunasagar hydro-electric project (Andhra Pradesh)	100000

	name of the scheme	installed capacity commissioned in kW
16	Madras thermal station extension (Madras)	30000
17	Periyar hydro-electric project (Madras)	105000
18	Kundah hydro-electric project (Madras)	145000
19	Trombay thermal station (private sector—Maharashtra)	187500
20	Akola (Paras) thermal station (Maharashtra)	30000
21	Ballarshah thermal station (Maharashtra)	15500
22	Khaperkheda thermal station extension (Maharashtra)	30000
23	Tungabhadra left bank power house (Mysore)	9000
24	Hirakud hydro-electric project (Orissa)	123000
25	Rourkela steel plant power station (Orissa)	75000
26	Bhakra—Nangal project (Punjab and Rajasthan)	207000
27	Kanpur thermal station extension (Uttar Pradesh)	15000
28	Eastern area power stations (Uttar Pradesh)	45000
29	Durgapur coke-oven plant thermal station (West Bengal)	60000
30	Indian Iron and Steel Co., power station (Burnpur) (West Bengal)	20000

ANNEXURE IX

Power—cost and benefits by States in Third Plan—State-owned utilities

(referred to in paragraph 48)

name of the State	outlay Rs. in lakhs			benefits in MW				
	continuing schemes	new schemes	total	during Third Plan			1966-67 first year of the Fourth Plan	beyond 1966-67
				from continuing schemes	from new schemes	total		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1 Andhra Pradesh	1934·0	4560·0	6494·0	178·8	180·0	358·8	100·0	510·0
2 Assam	550·0	2200·0	2750·0	31·0	96·2	127·2	25·0	25·0
3 Bihar†	1535·0	4023·0	5558·0	130·0	245·0	375·0	95·0	20·0
4 Gujarat*	50·0	4598·0	4648·0	18·0	250·0	268·0	..	288·0
5 Jammu & Kashmir	127·0	870·0	997·0	14·8	20·0	34·8	23·0	69·0
6 Kerala	2676·0	1680·0	4356·0	334·0	..	334·0	50·0	435·0
7 Madhya Pradesh	2309·0	5291·0	7600·0	145·5	281·5	427·0	89·0	390·0
8 Madras%	319·0	9700·0	10019·0	35·0	335·0	370·0	220·0	..
9 Maharashtra*	1674·0	6450·0	8124·0	255·0	405·0	660·0	120·0	..
10 Mysore	3070·0	3897·0	6967·0	236·6	356·4	593·0	178·2	735·0
11 Orissa	657·0	3805·0	4462·0	147·0	180·0	327·0	60·0	240·0
12 Punjab	718·0	6046·0	6764·0	139·4	363·0	502·4	22·0	1240·0
13 Rajasthan	765·0	2735·0	3500·0	103·1	153·5	256·6	39·0	..
14 Uttar Pradesh	4640·0	6196·0	10836·0	415·0	230·0	645·0	50·0	471·5
15 West Bengal†	1367·0	2340·0@	3707·0@	168·0	300·0	468·0	..	9·0
16 Damodar Valley Corporation**	2974·0	3039·0	6013·0	280·0	140·0	420·0	140·0	..
total	25365·0	67430·0	92795·0	2631·2	3535·6	6166·8	1211·2	4432·5

†Excludes outlay and benefits of DVC.
%Excludes outlay and benefits of Neiveli power station.
*Excludes outlay and benefits of Nuclear power station.
**Includes Centre's share.
@This is provisional and is subject to adjustment on account of increase in resources estimated at Rs. 4300 lakhs which the State Government expect to raise above the level of Rs. 9000 lakhs shown in Chapter VI—Financial Resources.

	name of the scheme	total installed capacity in kW
4	Srisailam hydro-electric project (Andhra Pradesh)	330000
5	Nahorkatiya thermal station (Assam)	67200
6	Umiam hydro-electric project stage II (Assam)	65000
7	Barauni thermal station extension (Bihar)	75000
8	Pathratu thermal station extension (Bihar)	250000
9	Thermal extensions in D. V. C. area (D.V.C.)	280000
10	Gandak hydro-electric project (Bihar)	15000
11	Kosi hydro-electric project (Bihar)	20000
12	Ahmedabad thermal station extension (private sector—Gujarat)	30000
13	Dhuvaran (Cambay) thermal station (Gujarat)	200000
14	Chenani hydro-electric project (Jammu & Kashmir)	15000
15	Jhelum hydro-electric project (Jammu & Kashmir)	27000
16	Salal hydro-electric project (Jammu & Kashmir)	60000
17	Sabarigiri (Pamba) hydro-electric project (Kerala)	300000
18	Idikki hydro-electric project (Kerala)	390000
19	Kuttiadi hydro-electric project (Kerala)	45000
20	Korba thermal station extension (Madhya Pradesh)	200000
21	Satpura thermal station (Madhya Pradesh)	180000
22	Tawa hydro-electric project (Madhya Pradesh)	42000
23	Punasa hydro-electric project (Madhya Pradesh and Gujarat)	576000
24	Kundah hydro-electric project (Madras)	240000
25	Mettur tunnel hydro-electric project (Madras)	100000
26	Periyar hydro-electric station extension (Madras)	35000
27	Neiveli lignite power station extension (Madras)	150000
28	Parambikulam hydro-electric project (Madras)	180000
29	Koyna hydro-electric project stage II (Maharashtra)	300000
30	Khaperkheda thermal station extension (Maharashtra)	60000
31	Akola (Paras) thermal station extension (Maharashtra)	60000
32	Bhusawal thermal station (Maharashtra)	60000
33	Nuclear power station (Maharashtra and Gujarat)	300000
34	Vaitarna hydro-electric project (Maharashtra)	45000
35	Sharavathy hydro-electric project stage II (Mysore)	534600
36	Sharavathy tail race development (Mysore)	145000
37	Talcher thermal station (Orissa)	240000
38	Balimela/Guntawada hydro-electric scheme (Orissa and Andhra Pradesh)	240000
39	Bhakra right bank power house (Punjab and Rajasthan)	280000
40	Uhl river hydro-electric project stage II (Punjab)	40000
41	Upper Bari-Doab canal project (Punjab)	22000
42	Beas project stage I (Punjab and Rajasthan)	240000
43	Thermal extensions (Rajasthan)	90000
44	Kotah hydro-electric project (Rajasthan and Madhya Pradesh)	78000
45	Harduaganj thermal station extension (Uttar Pradesh)	30000
46	Singrauli thermal station (Uttar Pradesh)	250000
47	Obra hydro-electric project (Uttar Pradesh)	80000
48	Bandel thermal station (West Bengal)	300000
49	Delhi thermal station extension (Delhi and Punjab)	180000

ANNEXURE X

Pattern of electricity consumption—all-India 1951-1961
(including generation in self-generating industrial establishments)

(referred to in paragraph 57)

class of utilisation	1951		1952		1953		1954	
	million kWh	% of total	million kWh	% of total	million kWh	% of total	million kWh	% of total
1	2	3	4	5	6	7	8	9
1 domestic or residential light and small power	595·005	7·9	628·882	7·9	690·516	8·0	759·169	7·9
2 commercial light and small power	331·533	4·4	336·628	4·2	399·107	4·6	446·156	4·6
3 industrial power*	4609·754	61·4	4908·222	61·4	5411·388	62·3	6002·387	62·9
4 traction	329·594	4·4	324·750	4·1	358·317	4·1	378·411	3·9
5 public lighting	67·917	0·9	73·942	0·9	81·445	0·9	93·938	1·0
6 irrigation	203·048	2·7	215·192	2·7	214·138	2·5	231·373	2·5
7 public water works and sewage pumping	211·583	2·8	219·764	2·7	240·374	2·8	267·471	2·8
8 consumption of auxiliaries, transmission losses etc. (including 5% of generation in self-generating industrial establishments)	1165·537	15·5	1296·544	16·1	1285·811	14·8	1397·008	14·4
9 total generation**	7513·971	100·0	8003·924	100·0	8681·096	100·0	9576·413	100·0

*In the absence of precise data, 5 per cent of generation in self-generating industrial establishments is assumed as losses.

**Includes generation from self-generating industrial establishments.

ANNEXURE IX (contd)

name of the State	outlay Rs. in lakhs			benefits in MW				
				during the Third Plan			1966-67 first year of the Fourth Plan	beyond 1966-67
	continuing schemes	new schemes	total	from continuing schemes	from new schemes	total		
(1)	(2)	(3)	(4)	(5)	(7)	(7)	(8)	(9)
Union Territories								
1 Delhi	300·00	1490·00	1790·00	30·0	135·0	165·0	..	..
2 Himachal Pradesh	78·00	119·00	197·00	..	2·0	2·0	..	..
3 Tripura	1·87	71·13	73·00	..	0·5	0·5	..	..
4 Manipur	5·50	101·08	106·58	..	2·8	2·8	..	..
5 Pondicherry	3·10	65·47	68·57	..	..	..	..	..
6 Andaman and Nicobar Islands	4·25	10·10	14·35	..	..	..	..	..
7 Laccadive, Minicoy and Amindive Islands	1·50	3·76	5·26	..	..	..	..	..
8 N.E.F.A.	16·57	43·43	60·00	1·0	1·5	2·5	..	..
9 N.H.T.A.	9·50	20·50	30·00	0·5	0·5	1·0	..	..
total of Union Territories	420·29	1924·47	2344·76	31·5	142·3	173·8	..	..
grand total	25785·29	69354·47	95139·76	2662·7	3677·9	6340·6	1211·2	4432·5

Note —Share of States from joint projects shown in the benefits for respective States.

ANNEXURE XI

Sector-wise growth of electricity consumption during First and Second Plans

(including generation in self-generating industrial establishments)

(referred to in paragraph 57)

	class of utilisation	1950* million kWh	1955* million kWh	% increase over 1950 (First Plan)	1960-61** (estimate) million kWh	% increase over 1955 (Second Plan)
	1	2	3	4	5	6
1	domestic or residential light and small power	524·6	850·4	62·0	1492·0	75·5
2	commercial light and small power	308·8	514·4	65·5	870·0	69·3
3	industrial power†	3983·6	6757·1	92·5	12313·5	82·5
4	traction	308·4	403·3	30·8	449·0	11·3
5	public lighting	60·3	105·6	75·0	192·0	82·0
6	irrigation	161·7	254·8	57·6	836·0	228·0
7	public water works and sewage pumping	189·1	284·6	50·5	455·0	60·0
8	consumption of auxiliaries, transmission losses etc. (including 5% of generation in self-generating industrial establishments.)	1038·0	1607·0	55·0	3242·5	102·0
9	total generation	6574·5	10777·2	64·0	19850·0	84·3

*Figures relate to calendar year.

**Figures relate to 1st April, 1960 to 31st March, 1961.

†Includes 95 per cent of generation from self-generating industrial establishments as in the absence of precise data, 5 percent of generation in self-generating industrial establishments is assumed as losses.

ANNEXURE X (contd.)

class of utilisation	1955		1956		1957-58		1958-59		1959-60		1960-61 (estimate)	
	million kWh	% of total	million kWh	% of total	million kWh	% of total	million kWh	% of total	million kWh	% of total	million kWh	% of total
	10	11	12	13	14	15	16	17	18	19	20	21
1 domestic or residential light and small power	850·426	7·9	934·122	7·9	1094·564	8·0	1238·044	8·0	1368·884	7·7	1492·0	7·5
2 commercial light and small power	514·423	4·8	545·853	4·6	611·512	4·5	682·818	4·5	758·988	4·3	870·0	4·4
3 industrial power*	6757·063	62·6	7403·858	62·5	8362·737	61·3	9488·486	61·5	11015·074	62·0	12313·5	62·0
4 traction	403·302	3·7	404·925	3·4	421·894	3·1	441·549	2·9	440·594	2·5	449·0	2·3
5 public lighting	105·631	1·0	117·767	1·0	141·402	1·0	156·066	1·0	175·420	1·0	192·0	1·0
6 irrigation	254·803	2·4	316·178	2·7	565·817	4·1	583·482	3·8	727·026	4·1	836·0	4·2
7 public water works and sewage pumping	284·637	2·6	317·076	2·7	365·649	2·7	392·617	2·6	430·845	2·4	455·0	2·3
8 consumption of auxiliaries, transmission losses etc. (including 5% of generation in self-generating industrial establishments)	1606·981	15·0	1831·863	15·2	2093·857	15·3	2431·507	15·7	2835·547	16·0	3242·5	16·3
9 total generation**	10777·266	100·0	11871·642	100·0	13657·432	100·0	15414·569	100·0	17752·378	100·0	19850·0	100·0

*In the absence of precise data, 5 per cent of generation in self-generating industrial establishments is assumed as losses.

**Includes generation from self-generating industrial establishments.

methods and forms of organisation are important factors in the stability and development of various village and small industries. In the last ten years, large programmes of assistance have been organised for these industries and considerable support has been given to them through provision of loans, subsidies, technical and marketing advice and, in some cases, through reservation of spheres of production. In the latter part of the Second Plan, marketing conditions for some of the small scale industries improved markedly following the intensification of import restrictions. The need for these restrictions may not continue indefinitely. Moreover, with the supply of electric power over large areas of the country, improvements in means of transport and communications, use of modern machines and techniques and the general advance of science and technology, the entire economy is being transformed. The problems of village and small industries, therefore, need to be constantly reviewed and necessary measures taken to realise the full potential of decentralised industry as an essential and continuing element in the national economy.

3. The progress during the First and Second Plans of different small industries, including handloom, khadi, village industries, small scale industries, handicrafts, sericulture and coir, was reviewed towards the middle of the Second Plan by a number of Working Groups and Committees. A special Study Team assessed the working of 25 industrial pilot projects which were taken up in community development blocks about six years ago. The Programme Evaluation Organisation also made a study of rural industries in selected community development blocks. Data collected in the course of these studies and the findings and conclusions reached have been of considerable value in formulating programmes for the Third Five Year Plan. A brief review of the progress of these industries in the first two Plans is given in the following paragraphs.

II

Review of Progress

4. In the First Plan, a major step taken for the development of village and small industries was the establishment of All-India Boards to advise and assist in the formulation of programmes of development for the Handloom Industry, Khadi and Village Industries, Small Scale Industries, Handicrafts, Sericulture and Coir. The Khadi and Village Industries Board not only prepared programmes for the industries with which it was concerned but also had them implemented through registered institutions and cooperative societies. In the case of other industries, responsibility for the implementation of programmes mostly rested with State Governments, although for a few programmes the Boards functioned on behalf of the Central Government for purposes of implementation. A notable development during the Second Plan was the establishment of a statutory Khadi and Village Industries Com-

CHAPTER XXV

VILLAGE AND SMALL INDUSTRIES

I

ROLE IN PLANNED DEVELOPMENT

VILLAGE and small industries have made a significant contribution in the First and Second Plans in realising the objectives of expanded employment, larger production and more equitable distribution. With the larger dimensions of the tasks to be accomplished in the Third Plan, their role will be even more important. The objectives of the programmes for these industries as set out in the Industrial Policy Resolution, 1956, and in the Second Plan are to create immediate and permanent employment on a large scale at relatively small capital cost, meet a substantial part of the increased demand for consumer goods and simple producers' goods, facilitate mobilisation of resources of capital and skill which might otherwise remain inadequately utilised and bring about integration of the development of these industries with the rural economy on the one hand and large-scale industry on the other. They also offer a method of ensuring more equitable distribution of the national income and avoiding some of the problems that unplanned urbanisation tends to create. With improvement in techniques and organisation, these industries offer possibilities of growing into an efficient and progressive decentralised sector of the economy providing opportunities of work and income all over the country. One of the principal aims of planning in this field, therefore, is to assist in the adoption of improved techniques and more efficient forms of organisation, so that full advantage is taken of the basic facilities and services available as a result of general economic development, and over a period the entire sector becomes self-reliant and self-supporting. At the same time, the pace of technical change will have to be so regulated that large-scale technological unemployment with consequent hardship and misery to millions of people is avoided.

2. An important lesson of the past decade is that where individual small industries, including village industries, have failed to adopt improved techniques or to achieve economies of scale and organisation through cooperation, production costs have remained relatively high and problems of unsold stocks and of decline in production and employment have arisen. These problems have come up in some of the traditional industries. Constant adaptation to the conditions of rapid change in a dynamic economy and the adoption of new techniques,

entrepreneurs because a sufficient number of artisans' organisations had not developed at the field level. In handloom and coir, however, assistance was channelled mostly through cooperative societies and in khadi and village industries mostly through registered institutions. In the First Plan considerable emphasis was laid on the organisation of industrial cooperatives as a means of promoting village and small industries. The number of industrial co-operative societies increased from 7105 in 1951 to about 15,300 in 1956. The handloom industry accounted for about 8000 cooperative societies; the next largest group was of palm-gur societies, followed by tanners' and leather workers' societies, societies of small scale induestries including light engineering goods, and sericulture. By 1959-60, the total number of industrial cooperatives increased to about 29,000, including about 11,200 handloom weavers' societies. On the whole, however, industrial cooperatives did not cover more than a small proportion of those engaged in village and small industries. In 1958, a special Working Group examined the difficulties impeding rapid progress in the formation of industrial cooperatives and recommended measures for ensuring their accelerated development. Action is being taken on the proposals of the Working Group.

7. The strengthening of administrative and organisational machinery and the expansion of assistance programmes combined with measures for giving an assured market for certain industries produced conditions favourable to the development of village and small industries. A detailed assessment of the progress made over the past ten years cannot be given for each industry in the absence of complete and reliable data, but in several industries a notable advance has been recorded.

8. According to information available at present, production of handloom cloth increased from about 742 million yards in 1950-51 to about 1900 million yards in 1960-61. Fuller employment was provided for nearly 3 million weavers and exports of handloom cloth on an annual average have been about 36 million yards during the last three years, valued at over Rs. 5 crores. The number of looms in the co-operative fold increased from less than 7 lakhs in 1953 to almost 13 lakhs by the middle of 1960. Production of traditional khadi (cotton, silk and woollen) increased from 7 million yards in 1950-51 to about 48 million yards in 1960-61. Employment, mostly part-time, was provided to nearly 11 lakh additional spinners, besides whole-time employment to about 1·4 lakh weavers, carpenters, etc. Production of Ambar khadi (produced from the admixture of Ambar yarn and ordinary charkha yarn) increased from 1·9 million yards in 1956-57 to about 26 million yards in 1960-61. Mostly part-time employment was provided by this programme to about 3 lakh spinners, besides full-time employment to about 51,000 weavers and others.

mission with more extensive executive powers than those enjoyed by the Khadi and Village Industries Board, which continued as an advisory body closely associated with the Commission. Further, in almost all States, statutory State Khadi and Village Industries Boards were created under legislation sponsored by State Governments. Steps were also taken to strengthen State Departments of Industries. Thus, a three-tier organisation was developed—the Ministry of Commerce and Industry at the Centre, All-India Boards, and State Departments of Industries and State Boards. In addition, industries officers were appointed at the district and block levels. At the end of the Second Plan, Extension Officers for Industries had been provided in more than 1650 development blocks out of 3110 blocks. Steps were also taken for the co-ordination of programmes by setting up at the Centre a Co-ordination Committee for Small Industries consisting of the representatives of the Ministries concerned and the Chairmen of the All-India Boards and the Khadi and Village Industries Commission. Co-ordination Committees were also constituted in most of the States.

5. An essential feature of development programmes in the First Plan was the provision of assistance in different forms such as credit, training facilities, technical advice, supply of improved tools and equipment on easy terms and establishment of sales depots. In the Second Plan, the scale of assistance for all these purposes was considerably enlarged, the total anticipated outlay being a little less than Rs. 180 crores as against about Rs. 43 crores in the First Plan. A number of new programmes were also organised. About sixty industrial estates were set up for providing factory accommodation and a number of common facilities for the promotion of small scale industries. A programme for the manufacture and distribution of Ambar charkhas on a large scale was undertaken by the Khadi and Village Industries Commission. A scheme was also introduced to assist handloom weavers' cooperatives to change over to powerlooms. Apart from these various programmes of assistance, steps were taken to provide a more assured market for the products of some of the industries. Production of certain varieties of cloth was reserved for the handloom industry and of certain types of agricultural implements for small scale industry. It was also decided that there should be no further expansion in certain large scale industries like vegetable oils, rice milling, leather footwear, match, etc. where the existing capacity was not being already fully utilised. Separate targets of production were laid down for the small-scale and the large-scale sectors of certain industries like bicycles and sewing machines.

6. In many of the industries, particularly small scale industries and handicrafts, assistance had to be given to individual artisans and

12. Handicrafts programmes were enlarged in the Second Plan and included the establishment of four Regional Design Centres, and a number of emporia and sales depots, besides training and production centres for specific crafts like ivory and conch shell products, bidri, decorative pottery, toys, bamboo articles, papier mache products, etc. There has been an increase in internal sales as well as exports of handicrafts. Over 100 emporia and sales depots have been set up and the annual sales through these increased from about Rs. 1 crore at the end of the First Plan period to about Rs. 2·5 crores in 1959-60. It is estimated that handicrafts including carpets worth over Rs. 6 crores per annum were exported during the last three years of the Second Plan period. Favourable conditions for stable and fuller employment were created for skilled craftsmen which in turn resulted in considerable improvement in their earnings. Progress was somewhat retarded by the shortage of technical personnel and certain basic raw materials and the difficulty in channelling credit to the artisans.

13. In the field of small scale industries progress during the past five years has been quite impressive. In spite of shortages of certain basic raw materials, many small industries, notably machine tools, sewing machines, electric fans and motors, bicycles, builders' hardware and hand tools have expanded considerably, the increase in production being as much as 25 to 50 per cent per annum. Import restrictions have to some extent given an impetus to the growth of these industries. The number of registered companies, with authorised capital of less than Rs. 5 lakhs each and engaged in processing and manufacturing, increased during 1957-61 by about 1160. In the programme of industrial estates also, considerable progress has been made, and by 1960-61 about 60 industrial estates were completed, of which 52 with about 1035 factory sheds employing about 13,000 persons were actually functioning. The programme for small scale industries as a whole is estimated to have provided full-time employment to about 3 lakh persons.

III

APPROACH IN THE THIRD PLAN

14. The main objectives to be kept in view in implementing programmes for village and small industries in the Third Plan will be:

(i) to improve the productivity of the worker and reduce production costs by placing relatively greater emphasis on positive forms of assistance such as improvement of skill, supply of technical advice, better equipment and credit, etc.;

(ii) to reduce progressively the role of subsidies, sales rebates and sheltered markets;

(iii) to promote the growth of industries in rural areas and small towns;

9. As regards the progress of village industries information is available only about the activities of registered institutions, cooperative societies and centres assisted by the Khadi and Village Industries Commission. The total disbursements for the programmes during the Second Plan period were a little over Rs. 18 crores, of which the major portion was accounted for by assistance in the form of supply of improved equipment and training and marketing facilities for the processing of cereals and pulses, crushing of oilseeds, tanning and leather, palm gur, non-edible oils and soap, match, hand-made paper, gur and khandsari, bee-keeping, pottery, etc. A substantial part of the disbursed amount remained unutilised in the earlier years of the Second Plan period. The Evaluation Committee for Village Industries which about the middle of the Second Plan reviewed the working of certain production centres set up with the assistance of the Khadi and Village Industries Commission, concluded that the results obtained in respect of both production and employment were not commensurate with the expenditure incurred. Since then, however, there has been considerable improvement in the utilisation of funds and also in the working of these centres. Village industry programmes in the Second Plan have provided partial relief to about 5 lakhs of artisans and under-employed women workers in villages. They have also furnished experience which should be useful in working out future patterns of industrial development in rural areas.

10. The programme for sericulture has been directed mainly towards improvement in the methods of mulberry cultivation and of the quality of silkworm seeds, supply of improved spinning and reeling equipment and organisation of research. The Central Sericultural Research Institute at Berhampore and its sub-station at Kalimpong was expanded and a training institute at Mysore and a Silkworm Seed Station at Srinagar established. Production of raw silk rose from 2·5 million lb in 1951 to 3·6 million lb in 1960. At the end of the Second Plan period, it was reckoned that the industry provided part-time employment to about 27 lakh persons, besides full-time employment to about 35,000 persons. The high cost of production continued to be the main problem of the industry largely due to the low yield of mulberry per acre, low yield of cocoons, etc.

11. Progress in the coir industry was generally slow owing to organisational deficiencies of coir cooperatives, inferior quality of coir yarn due to the inefficient equipment used for spinning, and competition from substitutes in foreign markets. Exports of coir yarn and goods suffered serious setback in 1957-58 and, although they have since increased to some extent, they are still below the level reached at the end of the First Plan period. The industry is at present estimated to provide employment to about 8 lakh persons.

17. Efforts will be organised on a larger scale to provide technical advice to artisans and craftsmen engaged in various industries. In the field of small scale industries, an industrial extension service has been built up through the Small Industries Service Institutes, the Extension Centres and the Extension Officers (Industries) at the block level. In the field of khadi and village industries, similar advice is made available through technical officers in the various registered institutions and centres and through extension officers in the blocks. Much, however, remains to be done to provide technical assistance and advice to every artisan and craftsman who needs it and efforts in this direction will have to be pursued more vigorously in the Third Plan.

18. Special attention will be paid to research for developing improved tools and equipment, processes of manufacture, designs, etc. The programmes for the expansion of existing facilities are outlined in the Chapter on Scientific and Technological Research.

19. *Credit and finance.*—Credit facilities, which are an essential requirement of all village and small industries, have to be organised on a larger scale in the Third Plan to be made available on reasonable terms and with the minimum of procedural delays. In the allocation for small scale industries in the Third Plan, a substantial provision has been made for loans under State Aid to Industries Acts to meet the need for long and medium term capital as well as working capital. Similarly, in the allocation for khadi and village industries, substantial amounts have been provided for the grant of loans. However, the provision which can be made for loans in the Plan is necessarily limited in relation to the requirements, and the aim to be kept in view is that in increasing measure the credit required for village and small industries should be available from normal banking and financial institutions. Under a pilot scheme operated by the State Bank of India for coordinated provision of credit to these industries, the credit limit sanctioned and in force by the end of March, 1961, was nearly Rs. 9 crores. Three other notable measures were taken during the Second Plan period for making credit available to village and small industries through institutional agencies. The Reserve Bank of India provides special facilities for advances to central cooperative agencies to meet the working capital requirements of the handloom industry. A pilot credit guarantee scheme under which Government shares with certain specified banks and other financial institutions risks on loans granted by them to small industries was introduced in July, 1960, and guarantees for loans amounting to Rs. 2 crores were issued by the end of 1960-61. A proposal was also formulated for providing a Government guarantee for loans given by banking and institutional agencies to well-established organisations in the field of village and small industries such as the Khadi and Village Industries Commission, the National Small Industries Corporation, etc. In the Third Plan it is

(iv) to promote the development of small scale industries as ancillaries to large industries; and

(v) to organise artisans and craftsmen on cooperative lines.

The policies and measures proposed for achieving these objectives are outlined below.

15. *Improvement of skill and productivity*.—Training facilities for meeting the requirements of technical and managerial personnel in the field of village and small industries will be considerably enlarged in the Third Plan. The arrangements to be made in this regard for the training of craftsmen and engineers are given in the Chapter on Technical Education. For rural artisans, a scheme has been drawn up to set up in selected areas 'cluster-type' institutions serving groups of villages for providing courses in certain allied trades such as blacksmithy, carpentry, etc. extending over a year or more with a view to training the artisans in the maintenance and repair of agricultural implements and parts of heavy agricultural machinery, etc. These institutions are intended to replace, where necessary, the production-cum-training centres set up earlier. In addition, training facilities will be available from peripatetic demonstration and training parties organised in rural areas by State Governments. Besides these general training programmes, special schemes for training in khadi, village industries and handicrafts will be taken up as a part of the development programmes for these industries. An All-India institute will also be set up to provide facilities for training in industrial extension techniques.

16. In all village and small industry programmes, emphasis is being laid on the introduction of improved tools and equipment. For small scale industries, a scheme for supply of machines on hire-purchase terms was introduced during the Second Plan period and it is proposed to expand it in the Third Plan so as to supply machines to a larger number of small industrialists and cooperatives. In the handloom sector, provision has been made for the introduction of 'take-up motion attachments' and semi automatic looms and also for continuing the limited programme introduced at the beginning of the Second Plan for conversion on a cooperative basis from handlooms to powerlooms. In the field of khadi and village industries, research and experiments for further improvement of the Ambar charkha and oil ghanis and of equipment used in hand-pounding of paddy and in other village industries will be continued. In the coir industry, on the basis of a pilot scheme for the introduction of improved coir spinning equipment, it is proposed to undertake the manufacture and supply of such equipment on a large scale. In sericulture, an important item of the programme is to encourage the use of cottage basins in place of charkhas for reeling. Similarly, in handicrafts the adoption of improved tools will be encouraged and assisted.

an appreciable extent, handloom, are already located in rural areas, the development of small scale industries has so far been, by and large, in or near the cities and the larger towns. Since one of the principal objects of programmes in this field is to provide opportunities of income and employment in a dispersed manner all over the country, emphasis in the implementation of the programmes in the Third Plan will be on encouraging the further growth of industries in rural areas and in small towns as well as in less developed areas having a marked industrial potential. The first step in this direction should be to identify the areas in which various basic facilities such as electricity, larger supply of agricultural raw materials and improved means of transport will become available as a result of development envisaged in other sectors during the course of the Third Plan and to prepare programmes for assisting the growth of industries in such areas. The desirability of linking up the promotion of small industries with programmes of power development in the rural areas has also been stressed in the Chapter on Irrigation and Power. The other essential step will be to provide various kinds of assistance such as training facilities, credit, technical advice, tools and machines, etc. in an integrated manner to those who set up industries in the rural areas and small towns. This aspect should be borne in mind in implementing schemes for cluster-type training centres for groups of villages, provision of credit to rural artisans, setting up of common facility workshops and rural industrial estates. For the better utilisation of resources under the Plan, the attempt should be to provide assistance intensively at points where conditions are relatively more favourable and to build up in this manner a number of successful centres which may serve as models and as nuclei for more widespread development. This would not only promote the growth of small industries under conditions favourable to their continuous growth, but will also help integrate industry with development in related fields.

23. With the increase in the production of cereals, pulses and a number of cash crops like sugarcane and oilseeds visualised in the Third Plan, there will be considerable scope for the expansion of processing industries in rural areas. With a view to providing fuller employment and strengthening and diversifying the rural economy, it will be desirable to develop these industries to the maximum extent in the decentralised and small scale sector and on a cooperative basis. The availability of basic facilities like power, trained labour and organised arrangements for the storage of raw materials and finished products will facilitate economic working of these industries. In rural areas, where such basic facilities may not be available for some time to come, rural artisans should be assisted to organise on cooperative lines to purchase and stock raw materials, adopt improved techniques and to establish arrangements for the sales of their products.

proposed to continue efforts along these lines. To ensure that the credit needs of artisans in rural areas are not overlooked while providing loans under State Aid to Industries Acts, it has been agreed that a portion of the funds to be disbursed under these Acts should be earmarked for artisans in rural areas and an equal amount for the same purpose should be made available from the budget of community development blocks.

20. *Role of subsidies, sales rebates, etc.*—The progressive enlargement of programmes of positive assistance is expected to make it possible to reduce the role of subsidies, sales rebates and sheltered markets in the Third Plan. In the field of khadi, it is hoped to bring about a gradual reduction of prices through technical improvements, pooling of production costs and economy in transport and other distribution charges. Rebates on sales of khadi, particularly of silk and woollen khadi, will be reviewed with the object of replacing them, as far as possible, by suitable management grants. As regards village industries also, it is proposed that the present subsidies and/or rebates on sales in respect of their products should be replaced by gradually tapering management grants. Similarly, in the handloom industry emphasis will be shifted from sales rebates to more positive forms of assistance.

21. Positive measures of organisation and assistance including arrangements for the supply of raw materials and coordination for research, training, etc. were mentioned in the First and the Second Plans as being among the element of a common production programme. The term 'common production programme' was adopted as a convenient way of describing the basic approach adopted for determining, while formulating programmes of development for different sections of an industry, the respective contributions which the large-scale and small-scale and cottage sectors could make towards the total requirements of the community, in the context of the social and other objectives. The other elements of the programme which had the object of providing a degree of preference or assurance in marketing to the small-scale sector were reservation of spheres of production, limiting the expansion of the capacity of the large sector of the industry, imposition of cesses on large-scale units and giving a price advantage to the smaller units through differential taxation, subsidies, sales rebates, etc. It was recognised that the general principles underlying common production programme should be applied only after detailed study and investigation of the problems of particular industries. For instance, in the case of some of the traditional industries, measures for ensuring preferential treatment and assurance of market for their products may have to be continued for a somewhat longer period than in the case of small scale industries.

22. *Industrial development in rural areas and small towns.*—Although several industries such as village industries, khadi, sericulture, coir and, to

of industrial cooperatives. In some selected areas, separate industrial cooperative banks may be set up provided certain conditions such as a large concentration of industrial units organised on cooperative lines and the prospects of raising of a part of the resources through deposits are satisfied. In the case of those small scale industries where industrial entrepreneurs or partnerships predominate, the formation of industrial associations will be encouraged for obtaining and distributing raw materials and for undertaking other functions such as dissemination of technical and other information, maintenance of accounts, etc.

26. *Arrangements for coordination.*—While at the Centre and at the State levels overlapping and duplication of effort in the formulation and implementation of programmes for village and small industries are avoided, as far as possible, in practice some overlapping and duplication do come about in such matters as establishment of emporia and sales depots, exhibitions, training, etc. Further means will need to be devised to secure coordination among the various Boards and agencies concerned with the implementation of the programmes. However, it is more at the field level that the need for greater coordination is being felt. This applies particularly to the programmes for khadi and village industries where the activities of State Governments, State Khadi Boards, registered institutions and the block level staff have to be more closely integrated. Moreover, with developments envisaged in the field of agriculture, power, transport, etc. it is necessary to take a unified view of the entire problem of rural industrialisation. The existing Boards may not always be able to take such a view because each of them operates in its own specified field. The rural industries programme of the Khadi and Village Industries Commission is at present limited to only 12 traditional industries. A comprehensive programme of rural industrialisation will have to take into account the various aspects of development in each area and it will be necessary to ensure that close cooperation of the various institutions and agencies working at the regional or block level is obtained for preparing local plans and implementing them. It is proposed to examine the various aspects of this question further in consultation with State Governments and the Boards.

OUTLAY AND ALLOCATIONS

27. In the Third Plan, a total outlay of Rs. 264 crores has been proposed for programmes of village and small industries, as compared with an estimated expenditure of a little less than Rs. 180 crores in the Second Plan. This is made up of about Rs. 141 crores for schemes of the States and Union Territories and about Rs 123 crores for the Central and Cen-

24. *Development of small industries as ancillaries.*—Some efforts were made during the First and Second Plans to promote the development of small scale industries as ancillaries to large industries, and such industries also grew up spontaneously in some measure. Various methods of promoting such growth are being examined by a special Committee. In the Second Plan, an important scheme was taken in hand for linking up the production of small units located in a new industrial estate at Bangalore with the production of a large project in the public sector, viz., Hindustan Machine Tools Limited. It is proposed to encourage similar schemes for some of the other projects in both the public and private sectors. In each branch of industry, with a view to planned development it is essential to take a comprehensive view of the requirements of the community, the contribution which small industries can make in relation to large-scale industries and the extent to which processes and stages of production can be decentralised. During the First and Second Plans, spheres of production of small and large units were demarcated in the case of some industries, such as cotton textiles and agricultural implements. In a few other industries such as bicycles, sewing machines and storage batteries, after estimating the requirements, separate targets of production were laid down for the large-scale and the small-scale sectors. Various aspects of integration between large and small industries have to be considered in detail for each industry. Among industries which are at present being studied are agricultural implements and machinery, machine and hand tools, bicycles and bicycle parts, sewing machines and sewing machine parts, automobile and diesel engine parts, radio receivers and amplifiers, tanning and footwear, fruit and vegetable preservation, cotton textile machinery parts, electric motors (fractional) and fans, paints and varnishes, storage batteries, scientific and table glass-ware, surgical and mathematical instruments and plastic products.

25. *Industrial cooperatives.*—In those industries where considerable progress has been made in the formation of cooperatives such as handloom and coir, the emphasis in the Third Plan will be on consolidation of the organisation and finances of the existing cooperatives and on bringing more of the workers within the cooperative fold. In other industries efforts will be directed towards the formation of industrial cooperative societies. The main steps proposed to be taken include provision of financial assistance to cover the expenditure on managerial and supervisory staff for a limited period, subsidisation of the rate of interest charged by the central cooperative financing agencies to the primary cooperative societies, expansion of facilities for the training of staff particularly at the middle level for industrial cooperatives and strengthening of the staff in the State Departments of Industries or Cooperation dealing with industrial cooperatives. A small nucleus organisation is also being set up at the Centre for ensuring coordinated implementation of the programmes for the promotion

30. *Handloom and powerloom industries.*—The principal aim of the handloom programme during the Third Plan period will be to bring about further expansion of handloom production through fuller employment of the handloom weavers and the introduction of improved techniques. Emphasis will be shifted gradually from rebate on sales—which has already been reduced from 6 nP. to 5 nP.—and other schemes involving subsidy to more positive forms of assistance. Loan assistance on a more liberal scale will be provided to weavers, so that on the basis of the larger share capital in the cooperatives, it becomes possible for them to borrow larger funds from institutional agencies. Further, a higher priority will be accorded to the supply of improved appliances including semi-automatic looms, provision of facilities for processing and training, introduction of improved designs and purchase of yarn requirements increasingly from cooperative spinning mills. It is proposed to revitalise a number of weak cooperative societies and also to set up some worksheds for common weaving centres on a pilot basis mainly to meet export requirements. Steps will also be taken to stimulate the exports of handloom cloth. The bulk of the handloom programme will be implemented by the State Governments and the Administrations of Union Territories. The programme which the Handloom Board will itself implement includes the expansion of the weavers' service centres already set up at Bombay, Madras, Varanasi, Calcutta and Kancheepuram, reorganisation of the two Institutes of Handloom Technology and publicity and propaganda.

31. With a view to improving the economic condition of handloom weavers, a programme for conversion of handlooms into powerlooms on a cooperative basis was undertaken early in the Second Plan period. This envisaged the installation of 35,000 powerlooms during the two years 1956—58. Progress was, however, very slow and only 3500—4000 powerlooms were installed out of about 13,000 sanctioned upto the end of the Second Plan period. The remaining 9000—9500 will be installed during the next few years. Effective steps have already been taken to check installation of powerlooms except by the handloom weavers' cooperatives.

32. Of the total production target of 9300 million yards of cloth set for the last year of the Third Plan period, the share of the decentralised sector, namely, the handloom. powerloom and khadi industries, has been fixed at 3500 million yards, as compared with its output of about 2350 million yards in 1960-61. The major portion of the additional production is expected to come from the handloom industry but no precise allocation of it between these different sections has yet been made. The position will be reviewed from time to time in the light of progress made in each sector.

33. *Khadi—traditional and Ambar.*—With the introduction during the Second Plan period of the Ambar charkha with its superior efficiency and

trally-sponsored programmes and schemes. The break-up of this outlay between different industries is given in the Table below:

Outlay for different industries

(Rs. crores)

industry	Second Plan (estimated expenditure)	Third Plan outlays States & Union Territories	Centre	total
handloom industry	29.7	31.0	3.0	34.0
powerlooms in the handloom sector	2.0	—	4.0	4.0
khadi—traditional	82.4	3.4	37.0	92.4
ambar			32.0	
village industries			20.0	
sericulture	3.1	5.5	1.5	7.0
coir industry	2.0	2.4	0.8	3.2
handicrafts	4.8	6.1	2.5	8.6
small scale industries	44.4	62.6	22.0	84 [illegible]
industrial estates	11.6	30.2	—	30.2
total	180.0*	141.2	122.8	264.0

It will be seen that considerably increased expenditure is contemplated on small scale industries and industrial estates. In the case of handloom, khadi and village industries, the level of expenditure is expected to be somewhat higher than in the Second Plan.

28. In addition to the outlay indicated above, there is a provision of about Rs. 20 crores made for the development of these industries in the programmes of community development and some provisions for the purpose have also been made in the programmes for the rehabilitation of displaced persons, social welfare and the welfare of backward classes. Further, about Rs. 275 crores are expected to be invested from private sources including banking institutions.

IV

Handloom, Khadi and Village Industries

29. The development programmes for the Third Plan have been formulated in the light of the experience already gathered and the findings and suggestions of the Evaluation Working Groups referred to earlier. In the case of khadi and village industries, there have been some modifications in the general conception of the programme. Under each programme, it is essential that expenditure on buildings and overheads is kept to the minimum.

*outlay anticipated is of the order of Rs. 175 crores.

These plans are to be executed by registered institutions as well as service cooperatives and gram panchayats. Thus, the responsibility of the Commission will be largely limited to provision of financial and technical assistance and training facilities and the preparation and execution of the programmes will be left to the State Boards, the institutions and the local agencies at the village level. Some steps have already been taken to ensure coordination with the other agencies engaged in rural development programmes but arrangements for bringing about coordination with the programmes for public participation like the Lok Karya Kshetra programme, etc. have not yet been completed.

35. The programme for khadi for the Third Plan will aim at gradual reduction of dependence on urban markets and correspondingly greater production for local use and improving the techniques of spinning and weaving so as to raise the output and earnings. Special attention will be given to improvement in the quality of khadi. By the end of the Third Plan period, about 40—50 per cent of the khadi production is expected to be marketed locally and the prices to be reduced by 15—20 per cent. Certain improvements in the Ambar charkha have already been introduced which are expected to raise the productivity from 1 hank per hour to 1·5 hanks per hour. These improvements are at present undergoing field trials. A Committee has also been set up to suggest measures for increasing the sales of hand-spun yarn and khadi.

36. The traditional charkha will continue to play a definite role, but greater efforts will be made to popularise the Ambar charkha. It is also proposed to bring into effective use 2·5 lakh Ambar charkhas out of 3.5 lakh charkhas already distributed and to introduce another 3 lakh charkhas in the gram ekais. Efforts will continue to be made to increase the productivity of the Ambar charkha from the present average of about 2 hanks to an average of 4 hanks and also gradually to increase their working period in the gram ekai centres, so that during the Third Plan period they will be worked on an average for considerably more than 2 hours in 200 days in a year, which was the average during the Second Plan period. As stated earlier, no precise allocation of production targets of cloth has been fixed for the different sections of the decentralised sector but a target of about 160 million yards of khadi is envisaged at present.

37. *Village industries.*—Rural artisans are usually dispersed in a large number of scattered villages and this, combined with their low standard of literacy and poor economic condition, is a considerable impediment to rapid implementation of development programmes. Among the other factors responsible for the slow progress of village industries' programmes have been the general lack of previous experience in regard to the development of these industries, lack of trained and qualified staff, location of production centres in unsuitable places, lack

output, it was thought that traditional khadi might, relatively speaking, become less important and the Ambar charkha might play a larger part in the future development of khadi. These expectations were not entirely fulfilled. Work on the Ambar charkha was new to the spinners and altogether different from that on the traditional charkha; the Ambar charkhas manufactured in the earlier stages were not all upto the mark and arrangements for servicing could not be organised to the extent required. Because of these initial difficulties, the Ambar charkhas were worked on an average for about two hours in a day for about 200 days in a year and the average production was only 1·8 hanks per day. The results fell considerably short of the earlier assumptions that the Ambar charkha could be plied for 8 hours in a day for 300 working days in a year and produce 8 hanks per day (the Ambar Charkha Enquiry Committee estimate was 6 hanks per day). The assumptions themselves might not have been realistic as hand-spinning is done largely by women and only as a part-time occupation. Even so, the earnings of spinners who took to the Ambar charkha show a fair improvement over those of traditional spinners, the average annual earnings being about Rs. 52 for Ambar as against about Rs. 35 for the traditional charkha. In some regions this average for spinners on the Ambar charkha has risen to about Rs. 80 to Rs. 100, and is similar to the average earnings of a large proportion of agricultural labourers. The Ambar spinners have been able to earn this amount in spite of the fact that the rate of spinning wage for the Ambar charkha has ben fixed at 2 annas per hank, as against 2½ annas for the traditional charkha. It is also deserving of note that the prices of khadi have not been allowed to rise in spite of the substantial rise which has taken place in the prices of cotton, and which has led to a rise in the prices of mill cloth. On the other hand, the increased production of khadi, both traditional and Ambar, resulted in the accumulation of large stocks in the last two years of the Second Plan period. Special steps have been taken for further development of sales including absorption of production locally.

34. Further development of khadi in the Third Plan will be mainly along the lines of the reoriented programme drawn up by the Khadi and Village Industries Commission in which the emphasis will primarily be on intensive efforts to secure integrated rural development of selected compact areas or gram ekais. It is proposed to organise 3000 gram ekais, each covering a village or group of villages having a population of 5000 each. The areas to be selected will be those in which some work has already been carried out under the Commission's intensive area scheme or the community development programme, or by some of the voluntary organisations, registered institutions and cooperatives. Another distinguishing feature of the future programme will be the preparation of local plans for the maximum exploitation of available resources for local use with a view to achieving local self-sufficiency to the extent possible.

Under the Rice Milling Industry (Regulation) Act, 1958, powers were delegated to the State Governments for licensing the installation of new rice mills or resumption of operation of defunct mills keeping in view not only the likely effects on the existing hand-pounding industry but also the scope for its further development. Further, it was also laid down that in permitting new rice milling capacity, preference should be given to rice mills to be run by cooperative societies. The actual working of the Act shows that new milling capacity has been licensed in some of the States and some of the main intentions of the Act have not been fulfilled. It is proposed to consider further the problems which have arisen with a view to ensuring that the policies visualised in the legislation are carried out effectively.

(ii) *Oilseeds crushing.*—The programme consists of storage of oilseeds and arrangements for their distribution, effecting improvements in the existing Wardha ghani and developing cheaper models with higher productivity. The improved ghanis are proposed to be manufactured in the centres for blacksmithy and carpentary.

(iii) *Tanning and leather.*—A study group is already examining the working of the flaying and carcass recovery centres with a view to suggesting a practical scheme for better flaying, curing and grading hides and skins and for improving the tanning of hides and skins. In the meanwhile, a special drive has been initiated to intensify the development of flaying, carcass recovery and tanning and it is proposed to set up 200 centres for intensive development.

(iv) *Match.*—There has been a change in the pattern of techniques and tools with the object of producing matches with a better marketability. In pursuance of the recommendations of the Cottage Match Special Enquiry Committee, it is proposed to set up 200 new 'D' class production units.

(v) *Gur and khandsari.*—Production units of varying sizes, equipped with hand-driven or pedal-driven centrifugals will be set up with a view to facilitating the use of power. Introduction of power-driven sugarcane crushers is also being encouraged and assisted.

(vi) *Bee-keeping.*—The main emphasis during the Third Plan period will be on a gradual expansion of the industry wherever possible on more intensive lines and developing the industry with a view mainly to the secondary results such as improvement of crops and fruits, etc. rather than the primary results. The programme envisages organisation of 44 area offices, 975 sub-stations and distribution of 94,500 bee-boxes.

(vii) *Other village industries.*—The programmes for other village industries like palm gur, hand-made paper, soap, fibre, etc. include

of adequate funds and organisation for procurement of raw materials in bulk and failure to introduce more efficient techniques of production. Even such technical improvements as were introduced did not go far enough to secure a material increase in productivity. They did not, therefore, gain general acceptance.

38. An intensive area scheme was undertaken during the Second Plan period which aimed at intensive development of khadi and village industries as part of a larger effort for developing an integrated rural economy. The basic unit for working out the scheme was a selected area comprising 30—40 villages with a population of about 20,000. The approach in this work has been to prepare village plans for utilising all available manpower and other idle resources and, therefore, the scope of the scheme includes measures for improvement of agricultural production through construction of wells and distribution of seeds and manure as well as construction of houses, roads, dispensaries, etc. At the end of September, 1960, the scheme was in operation in 65 intensive areas and 18 pre-intensive areas. Experience of the working of the scheme has suggested three main conclusions. Firstly, there is great scope for introducing improved techniques and mechanical power in villages without creating any difficulties in regard to the full employment of manpower. This is because there is considerable development potential in the village economy. Secondly, through proper local planning and organisation, it is possible to convert idle manpower into a productive resource. Thirdly, the development of village industries, if it is to be enduring, has to be closely linked up with the development of the rural economy as a whole.

39. In conformity with the reoriented approach and the aims referred to above, programmes for village industries for the Third Plan period have been prepared for implementation in compact areas and mainly to meet local requirements. Schemes for aid and assistance will be continued but, as mentioned earlier, present subsidies and/or rebates on sales in respect of the products of certain village industries will be replaced by suitable management grants on a progressively decreasing scale. The existing character of many of these industries is expected to change through the use of improved techniques and also the use of power, wherever available and considered desirable.

40. Some of the more important details of the programmes for different industries are given below:

(i) *Hand-pounding of paddy.*—It is proposed to introduce improved processes of parboiling, to train persons in improved methods of production, to continue research for production of improved equipment and to construct godowns.

42. *Coir industry.*—Over 55 per cent of the production of the coir industry is exported and the main emphasis in its development programme in the Third Plan will have to be on stepping up exports. The internal organisation of the industry which has grown up around the four processes of collecting husk, retting the husk, spinning coir yarn and making coir goods such as mats, mattresses, etc. has not been sufficiently strong and stable and has not helped in the growth of the industry on sound lines. Success of the development programme depends largely on organising properly the primary producer of coir yarn who is often a person with meagre resources "hemmed in between the husk dealer at the bottom and the exporter of fibre and yarn at the top who are in a position to dictate terms". A number of primary cooperative societies for these small producers have been formed, but quite a number have run into losses and it is essential that stricter control and greater supervision over their operations is introduced to ensure healthy development. Apart from placing the coir cooperatives on a more stable footing, an important task in the Third Plan will be to supply to the coir spinners treadle spinning machines with a view to improving the quality of yarn and also to make suitable arrangements for dyeing. A special export promotion scheme has been drawn up to assist registered manufacturers-cum-exporters of coir yarn and other products, who will be given facilities for import of baling hoops, sisal yarn and dyes. Other important items in the programme will be (i) promotion of new lines of production like bristle and mattress fibre, rope-making, utilisation of coconut pith and coir waste and blending of coir with other fibres and materials like rubber, and (ii) setting up of defibring plants for the manufacture of mattress and bristle fibre.

VI

Handicrafts

43. The All-India Handicrafts Board is concerned with the development of about 40 different crafts. Specific measures of development are being adopted for 12 of these crafts namely, carpets, art metalware, hand-printing, ivory, zari, wood work, papier mache, lacquerware, cane and bamboo and allied crafts, dolls and toys, pottery and jewellery. For these crafts the Board is assisted by special craft committees composed of representatives of craftsmen, manufacturers, dealers, exporters and State Governments. As a result of work undertaken in recent years, the key problems of various crafts have been identified and special steps will be taken to deal with them more fully during the Third Plan. Progress in some crafts depends largely on arrangements for the import and distribution of imported raw materials, as in art metal-ware and ivory; and in some, on improvements in processing and design and the solution of urgent technical problems, as in wood-work, lacquerware, pottery and

schemes for setting up production units, distribution of improved equipment, etc. It is also proposed to set up a few centres for the production of methane gas and to draw up a programme for the development of the lime industry.

V

Sericulture and Coir

41. *Sericulture.*—The emphasis in the development programme for the sericulture industry will be on reducing the cost of production, creating a suitable marketing organisation and exploring possibilities of increasing exports. The main factors affecting the cost of production of raw silk are of a continuing nature and a determined effort will have to be made in the Third Plan to bring about an appreciable improvement in the existing position. The cost of mulberry constitutes 60 per cent of the cost of raw silk and it is necessary that the yield per acre of mulberry which is at present comparatively low should be increased. At present only a small proportion of the area under mulberry is irrigated and mulberry cultivation has to face competition from more remunerative cash crops. The first step to be taken is, therefore, to make mulberry cultivation a paying occupation by increasing the yield per acre through irrigation and application of fertilisers. The other important factors affecting the cost of production of raw silk are the supply of disease-free seed and of more efficient reeling equipment. Greater attention will be given to these aspects in the Third Plan. It is proposed to develop an adequate seed organisation so that the supply of disease-free seed could be increased. In regard to reeling equipment, experience of the programme in the Second Plan is that where cottage basins have been introduced in place of traditional charkhas, the quality of silk has improved. In the Third Plan, it is intended to encourage this process of substitution further, especially as it would be easier to shift over to cottage basins from traditional charkhas without changing the decentralised character of reeling industry. Regarding marketing facilities, organised efforts will have to be made during the Third Plan period to provide facilities for cooperative marketing for both cocoons and raw silk. This would ensure an economic price to rearers and prevent an undue rise in prices of raw silk. The possibilities of increasing exports will have to be explored, in view of keen foreign competition, by producing fabrics of oriental design, colour and pattern. The efforts of the Central Silk Board and the State Governments will be directed towards the achievement of these objectives in the Third Plan. It is envisaged that production of mulberry and non-mulberry silk will increase to 5 million lb in 1965-66, as against 3.6 million lb in 1960.

industries. For instance, between 1956–60, the number of small scale units engaged in the production of bicycles increased from 44 to 150, of sewing machines from 35 to 75, of machine tools from 344 to well over 500, of electric motors from 6 to 74 and of electric fans from 22 to 47. The production of bicycles in the small-scale sector increased from about 25,500 in 1956 to 228,000 in 1960 and of sewing machines from 23,600 to 52,000. The value of ungraded machine tools produced by small units rose from Rs. 1·3 crores in 1956 to Rs. 4·0 crores in 1960. Large numbers of new units have also come into existence for the manufacture of dyestuffs and plastic products. There is little doubt that the growth of the economy anticipated during the Third Plan will provide large opportunities for both existing and new small scale industries. Development programmes in this sector have to be oriented and strengthened so as to enable small units to take the fullest advantage of these opportunities.

46. In the course of the Second Plan, a series of measures have been initiated with a view to making technical advice and information, credit and other facilities available for small scale industries. These will need to be developed further in line with the larger tasks set by the Third Plan. In addition to increase and diversification of production, programmes in the Third Plan must aim at securing closer integration between small-scale and large-scale units over a wide range of industries and the development of small industries as ancillaries. Small scale industries which now tend to concentrate in the larger cities and towns, should be promoted increasingly in small towns and at rural centres. Special efforts will also be made to develop cooperatives for production to the extent possible and also for purchase and distribution of raw materials, provision of common facilities, assembling of parts and components, marketing of products and securing orders in bulk. Along with cooperatives, trade associations comprising all small-scale units in each industry can also play a useful part. An essential aspect of development in the Third Plan will be to secure the fuller utilisation of available capacities through the adoption of two shifts and the provision of the requisite raw materials.

47. In the course of the Second Plan, the organisation for the development of small scale industries has been strengthened both at the Centre and in the States. It now includes 16 Small Industries Service Institutes with 4 Branch Institutes and 53 Extension Cenres. Together, these have a corps of technical and specialised personnel which now comprises over 300 officers and 1500 other staff. In the States also, Departments of Industries are now much better equipped. More than one-half of the development blocks served by the community devlopment programme already have Extension Officers for Industries. Small Industries Service Institutes have undertaken surveys of about 60 small

papier mache; and in some on quality control and observance of specifications and standards, as in zari and brassware. In all crafts more effective organisation of the artisans is a prerequisite for assuring sustained employment, bringing about technological improvements and providing larger facilities. The number of handicraft cooperatives has increased from about 1000 in 1957-58 to nearly 1600 at the end of the Second Plan. Handicrafts emporia, of which there are now 115, can do much to facilitate the development of cooperatives by providing orders, technical advice and raw materials and credit and other facilities. In the Third Plan work along these lines should be expanded. While cooperatives will constitute the main line of development in the field of handicrafts, there is scope also for the organisation of small entrepreneurs engaged in handicrafts into associations with a view to ensuring the adoption of improved business standards, control over quality and better conditions for artisans.

44. With a view to carrying to artisans throughout the country the results obtained at the four regional design development centres which were established during the Second Plan at Delhi, Bombay, Bangalore and Calcutta, it is proposed to set up design extension centres at selected places in which there are concentrations of craftsmen. Other activities to be undertaken include market research, promotion of inter-State marketing, laying down standards and specifications and extension of training facilities in the management of emporia, salesmanship and display. A Central Handicrafts Development Centre has been recently established with the object of studying the tools and techniques employed in different handicrafts and evolving suitable improvements. Common facility centres have been set up for certain crafts and will need to be extended during the Third Plan. For undertaking surveys and providing for training and experimentation, it is proposed to develop craft institutes for carpets, hand-printing, bamboo and cane work, metalware, embroidery and various carving crafts. There is considerable scope for the expansion of exports in handicrafts, specially through ensuring quality control, pre-shipment inspection, provision of raw materials, credit and other services to exporters of handicrafts, securing orders from abroad and greater publicity with a view to the development of new markets. These programmes should be accelerated. In the past handicrafts catered mainly to the needs of foreign markets and the higher income groups. In addition to exports, the production of handicrafts has to be oriented towards meeting the needs of customers in different income groups within the country itself and the promotion and development of rural crafts.

VII

Small Scale Industries

45. The growth of small scale industries constitutes one of the most significant features of development during the Second Plan. This is illustrated by such statistical data as are available for individual small

49. Among other developments in the field of small scale industries envisaged in the Third Plan, reference may be made to the proposed establishment of depots for stocking raw materials in short supply to be made available to small units with a view to assisting in the fuller utilisation of existing capacity. Facilities for training in the manufacture of small machines will be enlarged through the establishment of additional proto-type production and training centres. It is also proposed to set up an industrial design institute and to encourage inventions through prizes and other means. Schemes for quality marking of certain products, such as were initiated during the Second Plan in some States, will be further developed. Three States have recently set up Small Industries Corporations for constructing industrial estates and running raw material depots and common service facility centres. Similar Corporations are being considered in some other States.

50. *Industrial estates.*—The programmes for industrial estates was very popular in the Second Plan and about 60 estates were set up. While many of these estates have been successful in their main aim of providing suitable factory accommodation and other conditions favourable to working efficiency, expenditure on some of them has been on the high side and the new employment created is not yet commensurate with the expenditure incurred. Moreover, since most of the industrial estates have been located close to fairly large towns, the objective of establishing new centres of industries has been achieved only to a limited extent.

51. Besides the 60 industrial estates mentioned above, there are another about 60 industrial estates, started or sanctioned during the Second Plan period, which have still to be completed. It is proposed to set up during the Third Plan period about 300 more new industrial estates of varying sizes and types. They will be located as far as possible near small and medium-sized towns. It is also intended to start a number of industrial estates in selected rural areas where power, water supply and other essential facilities are available or can be readily provided. A rural industrial estate will consist mainly of worksheds for use by artisans along with certain common service facilities and will have only a limited number of regular factory sites and premises. Care will have to be taken to locate such estates in areas where there is a sufficient concentration of artisans and craftsmen who will be in a position to make use of improved techniques, better tools and relatively modern facilities.

52. At appropriate places, particularly near large cities and towns, it is envisaged that only developed sites should be provided on which small entrepreneurs could erect their own factory buildings, instead of establishing an industrial estate complete with factory premises. With a view to promoting small ancillary industries, it is proposed to start some

industries and 102 different areas. In several districts, special studies of the possibilities of developing small scale industries have been carried out. Surveys of individual small scale industries undertaken at regular intervals can materially assist the planned development. 'Prospect Sheets' are being prepared for a series of industries. A large number of model schemes have also been drawn up. Guidance along these lines for starting new industries should be made available to new entrepreneurs and to cooperatives of artisans as well as educated youth. The programme for the expansion of training facilities during the Second Plan included training in business management and in engineering and non-engineering trades as well as training for district industries officers and block level extension officers. Mobile workshop vans provided a measure of training for artisans in the operation of machines. In each area, in cooperation with State Industries Departments and other agencies, the existing facilities will be further extended during the Third Plan.

48. Besides building up the necessary organisation for the development of small industries, progress was made in the Second Plan in establishing facilities for the provision of credit, supply of machines and development of marketing and stores purchase. In each of these directions considerable expansion is envisaged for the Third Plan, the main aim being to provide larger facilities for cooperatives, small entrepreneurs and new entrants. Although a beginning has been made in the grant of credit facilities through the scheme operated by the State Bank of India and guarantees for bank loans provided by the Reserve Bank of India, there is vast scope for the extension of credit to small industries by commercial banks generally. Similarly, State Financial Corporations could also provide a larger measure of assistance to small scale industries. The National Small Industries Corporation has supplied machines on hire-purchase terms of the total value of about Rs. 4.2 crores, including over Rs. 1 crore during 1960-61. It should be possible to extend this scheme and to enable much larger numbers of cooperatives and small entrepreneurs to avail of hire-purchase facilities. Extension of hire-purchase facilities on the part of State Governments and their various agencies would facilitate the development of small scale industries. Stores purchase policies can make a valuable contribution both towards increase in the production of small units and towards the development of new lines of production. Thus, the value of purchases made by the Central Government from cottage and small scale industries rose from Rs. 74 lakhs in 1953-54 to nearly Rs. 6 crores in 1960-61. The benefits of stores purchase can be considerably enhanced if purchases are planned for sufficiently in advance and this is accompanied by carefully worked out development programmes. Stores purchase policies and related programmes need to be developed more extensivley in the States and also at the Centre.

STATISTICS

55. Although surveys of a number of industries and specific areas have been carried out by different agencies and organisations in the past, basic statistical data for small industries for the country as a whole, which are essential for making a quantitative assessment of the impact of the programme and for drawing up new plans, are still lacking. A complete list of industrial units is, however, expected to be available through the Census of 1961 and, using this as the 'frame', it is proposed to conduct bi-annual surveys to cover initially all units which employ 10 or more workers (whether using power or not) and having a capital investment not exceeding Rs. 5 lakhs each.

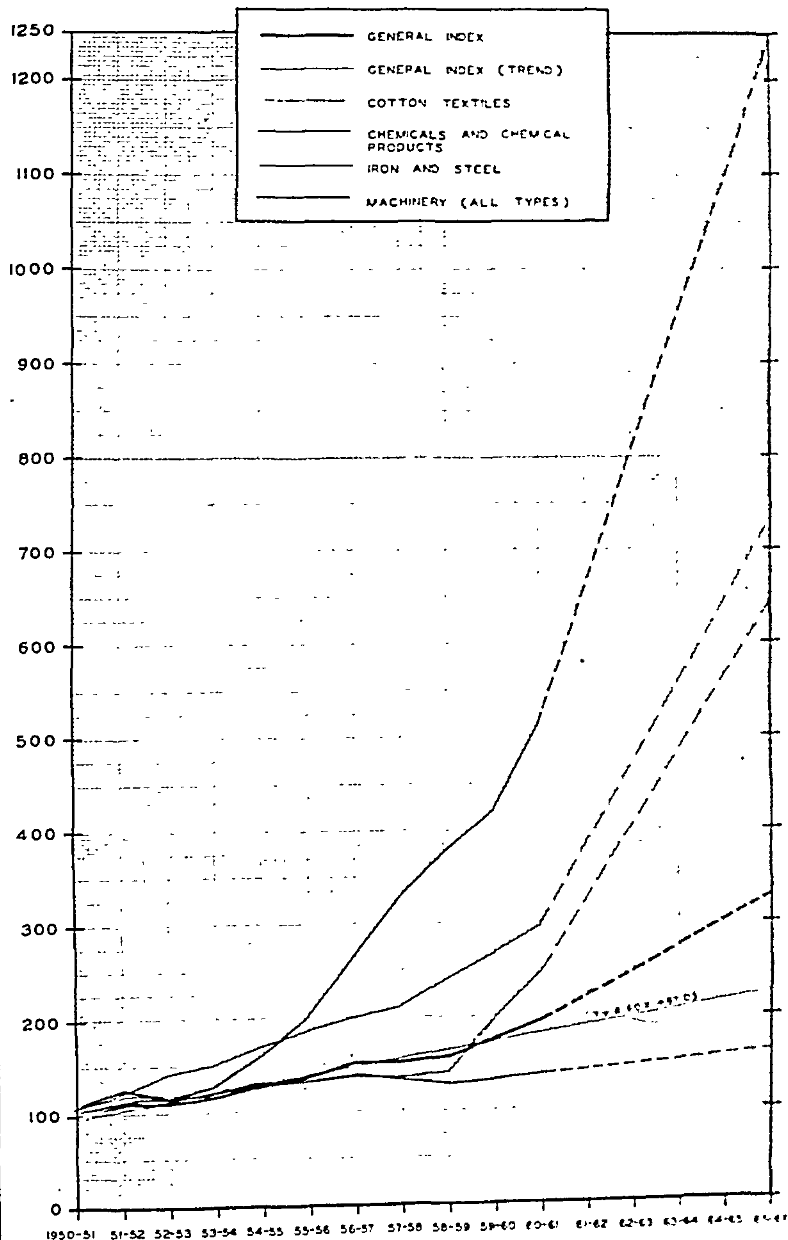
'functional estates' for the specific purpose of accommodating small units which will be working as ancillaries to related large-scale industries. A few industrial estates are also proposed to be set up on a pilot basis in selected universities to enable students to earn while they are pursuing their studies and also to provide them with training, so that later they can start their own businesses. Certain suggestions have already been made by a team set up by the Committee on Plan Projects for securing economies in the general lay-out of industrial estates and the construction of factory buildings, etc. These will have to be followed closely in setting up new industrial estates during the Third Plan.

Employment

53. On the basis of the total investment under the Third Plan, including outlay in the public sector and investment from private sources, it is estimated that the development programmes for village and small industries outlined in this Chapter will provide part-time employment or fuller employment for about 8 million persons and whole-time employment for about 9 lakh persons. Programmes for the production of khadi are expected to provide mostly part-time employment and those for the handloom industry, powerlooms in the handloom sector, village industries, sericulture and coir industries to provide mainly fuller employment to those already engaged in them. The programmes for small scale industries, including industrial estates and handicrafts and, to a limited extent, some of the other industries, are expected to create mostly whole-time employment.

Exports

54. Exports of coir yarn and manufactures, handloom fabrics and handicrafts are valued at an annual average of about Rs. 21 crores. In several directions products of small scale industries have also begun to contribute towards exports. For instance, 600,000 pairs of leather shoes supplied by small units were exported during the Second Plan. Items of production like cotton hosiery, sports goods, builders' hardware, leather goods, canned fruits and vegetables and other products have been recently selected for export promotion. It should be possible to secure stable and expanding markets for a growing range of products of small industries. It will, however, be essential to give constant attention to improvement and standardisation of quality, reduction of cost, introduction of new designs and to the proper organisation of production. Schemes of quality marking should be extended widely as they are an important means for bringing about improvements in production and for creating confidence among foreign buyers.



INDEX OF INDUSTRIAL PRODUCTION
BASE 1950-51 = 100
GENERAL INDEX
GENERAL INDEX (TREND)
COTTON TEXTILES
CHEMICALS AND CHEMICAL PRODUCTS
IRON AND STEEL
MACHINERY (ALL TYPES)
1250
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
1950-51
51-52
52-53
53-54
54-55
55-56
56-57
57-58
58-59
59-60

CHAPTER XXVI

INDUSTRIES

REVIEW OF PROGRESS UNDER THE TWO PLANS

THE past decade has witnessed the beginning of an industrial revolution in India. During this period the growth and diversification of industry have been quite remarkable and particularly rapid in the five years of the Second Plan. In this short space of time three new steel works, each of one million tons capacity, have been completed in the public sector and two existing steel works in the private sector have been doubled so as to bring their ingot capacity to two and one million tons respectively. The foundations have been laid of heavy electrical and heavy machine tools industries, heavy machine building and other branches of heavy engineering, and the production of machinery for the cement and paper industries has been started for the first time. In the field of chemical industries there has been an advance on a wide front, leading not only to larger units and greatly increased output of basic chemicals, e.g., nitrogenous fertilisers, caustic soda, soda ash and sulphuric acid, but also to the manufacture of a number of new products e.g., urea, ammonium phosphate, penicillin, synthetic fibres, industrial explosives, polyethylene, newsprint, and dyestuffs. The output of many other industries has increased substantially, e.g. bicycles, sewing machines, telephones, electrical goods, textile and sugar machinery. New skills have been learnt by the workers and, at the other end of the scale, a large and growing class of industrial managers has come into being. In overall terms organised industrial production has practically doubled in the last ten years, the index of industrial production having risen from 100 in 1950-51 to 194 in 1960-61.

2. This bare recital of facts hardly does justice to the progress that has been achieved. To the eye of the beholder much more impressive testimony of the upsurge of industrial activity is conveyed by the great new steel works, the huge new open cast mines, the new industrial townships and the various factories springing up in the environs of the main cities of the country. Viewing the industrial scene as a whole, independent expert opinion has borne testimony to the great progress achieved in quite a short space of time and has characterised the broadening of the industrial base and the buoyancy of manufacturing

enterprises as the most striking change in the Indian economy since the beginning of the Second Plan.

3. There can be no doubt that in the industrial field far-reaching gains have been secured. It must, however, be recognised that this success, considerable though it is, has so far been insufficient to make any great impact on the general condition of the mass of the population or radically to alter the structure of the economy. Moreover, compared with the industrial targets which the country set itself, there have been some large shortfalls. Thus, while the setting up of the three new steel plants under the Second Five Year Plan was by itself a most impressive achievement, their combined output of steel was only 0·6 million tons in 1960-61 as against the target of 2 million tons. Similarly in the case of the Tata Iron & Steel Works (TISCO) production has fallen short of the target set for the Second Plan period, the actual output of saleable steel for the five-year period being only 4·5 million tons as against 5·2 million tons reckoned upon in the 1955 forecasts of the Tariff Commission. In the field of fertilisers, the expansion of the Government Sindri Fertilizer Factory and, in the private sector, the ammonium chloride project at Varanasi were not completed till 12 to 18 months after the scheduled date and have since been facing serious teething troubles in reaching capacity output. The three new fertiliser plants in the public sector at Nangal, Neiveli and Rourkela, have all been delayed by one or two years; whereas they were all planned to be more or less in full production in 1960-61, the Nangal plant came into partial production only in January, 1961, while the other two are still under construction. The delay in their case, as also in that of the Heavy Electrical Project at Bhopal, is mainly due to foreign exchange difficulties. The same cannot be said of the Heavy Machinery, the Mining Machinery and the Foundry/Forge Projects. All these three projects which should by now have been quite far advanced in their construction are still in their initial stages and instead of making a valuable contribution to the Third Plan will only begin to yield output at the end of it. In the case of the project for the manufacture of organic intermediates, which is of cardinal importance for the dyestuffs, plastics and drugs industries, the delay in implementation has been due, apart from the time involved in defining the exact scope and content of the project and other preliminaries, to difficulties in concluding negotiations with overseas collaborators. The experience of the Second Plan has shown that the gestation period of a project, especially in the case of heavy engineering industries, is generally longer than expected. This highlights the importance of advance planning.

4. The main industrial targets which have not been achieved are those set for iron and steel, fertilisers, certain items of industrial

the project cost estimates have occurred in the case of TISCO in the private sector. The capital expenditure on their expansion programmes has increased by about Rs. 30 crores over the initial estimates. While differences of this kind may have been inescapable in the past in view of the lack of experience in project engineering, the importance of achieving more accurate estimates requires to be emphasised. In other countries consultant organisations specialising have played an important part in this field and in the last few years similar agencies have begun to spring up in this country also, and they should be able to assist entrepreneurs in project evaluation and in estimating capital costs in a more thorough and scientific manner.

7. In the last ten years, some success has been achieved in the dispersal of industry. The selection of the locations for the three new steel plants (Bhilai, Rourkela and Durgapur), the Heavy Machinery Plant (Ranchi) and the Heavy Electrical Project (Bhopal) and the decision to exploit the lignite deposits at Neiveli in Madras, justified as these all were on purely economic grounds, have also had the effect of creating new centres of industry in areas of the country hitherto untouched by it. Preference in fact has always been given to the location of public sector projects in relatively backward areas whenever this could be done without significant prejudice to technical and economic considerations; and this will be the guiding principle for the future also. Similarly in the licensing of private sector projects the claims of under-developed regions have generally been kept in view to the extent possible.

Financing of the Industrial Programmes

8. The overall fixed investment on public sector projects in 1956-61 has been about Rs. 770 crores as against the original estimate of Rs. 560 crores. For the private sector, the corresponding investment figures are Rs. 850 crores and Rs. 685 crores respectively. Except in the case of the expansion of the Sindri Fertiliser Factory, where internal resources played some significant part in financing new investment, public sector projects were carried out by means of advances from Government in the form of equity capital and loans. The foreign exchange cost of Government steel works, machine-building, mining equipment and heavy foundry/forge projects was met mainly from credits advanced by friendly countries. The equity participation that was originally proposed by Krupp-Demag in the Rourkela Steel Works was the only sizeable private investment envisaged in a public sector project. This was given up in 1956 in the course of negotiations regarding contracts for the purchase of machinery. The steel expansion programmes in the private sector were assisted to the extent of Rs. 70 crores by the International Bank for Reconstruction and Development (I.B.R.D.) and by credits from other international sources and by Rs. 20 crores of interest-free advances

machinery, e.g. paper and cement plant machinery, heavy castings and forgings, aluminium, newsprint, raw films, chemical pulp, soda ash, caustic soda, dyestuffs and cement. The shortfalls have unfortunately occurred in some of the very industries which are of crucial importance and have deprived the economy of benefits reckoned on for the start of the Third Plan. The relevant figures are given below:

Table 1: Production targets for 1960-61 and actual performance

	unit	production targets	actual production
steel finished	million tons	4·3	2·2
nitrogenous fertilisers (in terms of nitrogen)	000 tons	290·0	110·0
phosphatic fertilisers (in terms of P_2O_5)	000 tons	120·0	55·0
textile machinery	Rs. crores	17·0	9·0
cement machinery	Rs. crores	2·0	0·6
paper machinery	Rs. crores	4·0	..
aluminium	000 tons	25·0	18·5
newsprint	000 tons	60·0	25·0
chemical pulp	tons	30000·0	..
soda ash	000 tons	230·0	145·0
caustic soda	000 tons	135·0	100·0
dyestuffs	million lb.	22·0	11·5
cement	million tons.	13·0*	8·5

Most of the other targets of capacity and production have been approximately fulfilled and in some cases, e.g. power driven pumps, diesel engines, electric motors, A.C.S.R. cables, electric fans, radio receivers and sugar exceeded.

5. Broadly speaking, it can be said that the industrial advance has been in keeping with the avowed objective of enabling the economy to reach as soon as possible the stage of self-sustaining growth, for, despite the shortfalls, notable progress has been achieved in the development of iron and steel, heavy engineering and other capital goods industries.

6. The actual cost of many of the projects has been more than what was envisaged when the Second Plan was drawn up. For instance, on the basis of preliminary project reports, a provision of Rs. 425 crores was made in the Second Plan for the three public sector steel plants, their townships, ore mines and quarries. The first detailed estimates available by the end of 1956 indicated the revised investment requirements as Rs. 559 crores exclusive of escalation. The latest estimate of the actual outlay on the steel plants and ancillaries referred to above amounts to Rs. 620 crores. The further rise in cost as compared to the 1956 estimates has been explained as due primarily to increases in the quantities of work and to escalation. Similar divergences between actual outlay and

*Revised to 10-11 million tons in May, 1958.

estimated to have been achieved to the extent of only about 85 to 90 per cent. The wide gap between the rather high target originally set for the cement industry and the capacity actually achieved accounts for a high proportion of the overall shortfall in the physical performance.

Third Five Year Plan: Objectives and Overall Approach

12. The industrial plan for the period 1961-66 has to be governed by the over-riding need to lay the foundation for further rapid industrialisation over the next 15 years, if long-term objectives in regard to national income and employment are to be achieved. From this point of view it is essential to press forward with the establishment of basic capital and producer goods industries—with special emphasis on machine building programmes—and also with the acquisition of the related skills, technical know-how and designing capacity, so that in the following Plan periods the growth of the economy in the fields of power, transport, industry and mineral production will become self-sustaining and increasingly independent of outside aid.

13. There are, however, other factors which have also to be kept in mind. Thus, while long-term objectives require concentration on capital goods industries and increased production of processed industrial raw materials, the industrial programme for the Third Plan has also to provide, to the extent possible, for meeting the demand likely to be generated over the next 5 years for a wide range of other manufactured goods. Owing to the need to devote a large portion of available resources to laying the foundation for future development, it may be difficult to meet this demand in all cases. The aim is to provide fully for essential needs, but restraint on consumption will be unavoidable, especially in the case of goods of luxury of semi-luxury character the production of which it will be difficult to increase pari passu with the growth of demand.

14. The operation of industries depends not only on markets but also on the supply of raw materials, power, fuel and facilities for transport. Industrial programmes have, therefore, necessarily to take into account, and will in fact be limited by, the rate at which the supply of raw materials, power, etc. can be increased. In particular, power and fuels are likely to be inhibiting factors in the first half of the Third Plan period. This may entail forgoing in some instances the adoption of industrial processes which make a heavy demand on electric power, notwithstanding their attractiveness.

15. *Industrial policy.*—The expansion of industry will continue to be governed by the Industrial Policy Resolution of April, 1956. As in the Second Plan the roles of the public and private sectors are conceived of as

from the Government of India. The high levels of investment recorded by private enterprise in other fields were facilitated by deferred payment arrangements resorted to on a considerable scale.

9. The quantum of funds drawn by private enterprise from each of the recognised sources as compared with the Plan expectations is currently estimated as follows:

Table 2: Sources of supply and quantum drawn by private enterprise

(Rs. crores)

	Second Plan expectations	latest estimates for the Second Plan
loans from institutional agencies	40	80
direct loan/participation by Central and State Governments	20	20
foreign capital including suppliers' credit	100	200
new issues	80	150
internal and other resources	380	400
total	620	850

10. The current assessment of the break-up of the overall investment in organised industries as compared with the estimates as forecast in the Introduction to the volume on the Programmes of Industrial Development : 1956-61 (page ix) is as follows:

Table 3: Overall investment break-up

(Rs. crores)

	forecast under the Second Plan	current assessment
metallurgical industries (iron & steel, aluminium and ferro-manganese)	502·5	770·0
engineering industries (heavy and light)	150·0	175·0
chemical industries (heavy chemicals, fertilisers, drugs and pharmaceuticals, coal carbonisation, dyestuffs, plastics and chemical pulp)	132·0	140·0
cement, electric porcelin and refractories	93·0	60·0
petroleum refining	10·0	30·0
paper, newsprint, security paper	54·0	40·0
sugar	51·0	56·0
cotton, jute, woollen and silk yarn and cloth	36·3	50·0
rayon and staple fibre	24·0	34·0
others	41·5	115·0
replacement and modernisation	150·0	150·0
total	1244·3	1620·0

11. In spite of the large investment (about 30 per cent above the Plan estimate) the physical targets set under the Second Plan are broadly

supplementary and complementary to one another. For example, in the case of nitrogenous fertilisers where the public sector has already assumed a dominant role, it is envisaged that during the Third Plan the private sector will enter this field in a bigger way than in the past and supplement the efforts of the public sector. In the case of pig iron, the policy has been relaxed to allow the establishment of plants in the private sector with a maximum capacity of 100,000 tons per year as compared to units of 15,000 tons permitted so far. Programmes for the manufacture of dyestuffs, plastics and drugs in the private sector will be largely complementary to the programme for the manufacture of primary aromatic compounds as by-products at the steel works and of organic intermediates to be undertaken in the public sector. Similarly, whereas the manufacture of bulk drugs will be organised in a big way in the public sector, the further processing of bulk drugs will also be undertaken in the private sector.

16. Against the background of the goal of a socialist pattern of society, it is necessary in encouraging and approving programmes in the private sector to guard against industrial development being concentrated in the hands of a few entrepreneurs and leading to complete or partial monopolies. This matter has been discussed in paragraphs 26 to 29 of Chapter I.

17. *Industrial priorities.*—Plans for industrial expansion have to hold a balance between different and competing claims of nearly equal importance. There are, however, certain general considerations which require to be mentioned. In the first place, where there are wide gaps between capacity and production or where, by multi-purpose shift operation or the addition of balancing equipment, it is possible to secure greater output at diminishing cost, fuller utilisation of existing installed capacity must take precedence over expansions or the setting up of new units. Secondly, expansion of existing plants will have to be given preference over establishment of new units since the creation of additional capacity in this manner will not only be quicker but will also assist in bringing down the investment costs per unit output. For example, the expansion of the Bhilai, Rourkela, and Durgapur Steel Plants will lower the investment from about Rs. 2000 to Rs. 1500 per ton of finished steel and have a beneficial effect on the level of retention prices.

18. As regards new developments the accent will have to be on projects which, by contributing to exports, will earn or, by replacing imports, will save foreign exchange. It will not be possible to allow significant expansion of industries, which are heavily dependent on the import of raw materials and whose expansion, therefore, until these materials are available within the country, swells the demand for foreign exchange on maintenance account. On the other hand, having regard both to the

only to Rs. 2570 crores—Rs. 1470* crores for the public sector and Rs. 1100 crores for the private sector. In addition, it is hoped that about Rs. 150 crores will be forthcoming for meeting the continuing arrears of replacement and modernisation in certain pre-war industries.

24. These estimates point to the probability that in both sectors there will be a sizeable spill-over into the Fourth Plan and that the physical targets will not all be achieved by the end of the Third Plan period. Some spill-over would be probable in any case considering the very preliminary stage which some of the projects have so far reached, the uncertainties about foreign exchange and the relatively long gestation periods in the case of heavy industries. It is difficult at this stage to forecast with any great degree of accuracy which projects will get delayed and spill-over into the Fourth Plan and which of the physical targets will not be achieved. The matter is, however, discussed further in connection with the public and private sector programmes.

Public Sector Programmes

25. *General observations.*—The industrial and mineral programmes of the public sector, exclusive of defence industries and projects of the Ministries of Railways and of Transport and Communications designed to meet their own operational requirements, e.g. electric and diesel locomotives, telephones and teleprinters are shown in Annexures I and II. Their overall cost is about Rs. 1882** crores, whereas the provision that it has been possible to make for them is only Rs. 1520 crores (Rs. 1450 crores at the Centre and Rs. 70 crores in the States). It is probable, therefore, that, as already stated, their full implementation will take rather more than five years. It is not possible at present to say what stage each one of the public sector projects will have reached by 1965-66 but some general indications can be given. It will be seen that in Annexure I projects of the Central Government have been grouped in three categories, viz.

(1) projects under execution and carried over from the Second Plan;

(2) new projects for which external credits are already assured wholly or partly; and

(3) new projects for which external credits have yet to be arranged.

It may reasonably be assumed that all the projects falling in category (1) will be completed during the Third Plan. This should also apply to

*Excluding Rs. 50 crores to be transferred to the private sector.

**This is exclusive of an additional amount of Rs. 20 crores expected from non-Governmental sources for two projects.

Rs. 1882 crores given elsewhere as the outlay requirements of the public sector for industries and minerals. The difference arises from the fact that the latter figure includes (a) assistance to plantation industries, which do not strictly fall within the scope of manufacturing industries, (b) the cost of the construction subsidy given to Hindustan Shipyard, (c) programmes of the National Productivity Council and the Indian Standards Institution and expenditure on the extension of the metric system of weights and measures, and assistance to the private sector through the National Industrial Development Corporation (N.I.D.C.) and direct loans and State participation in private undertakings.

21. The estimate of investment on replacement shown in the above Table falls short of the minimum requirements of the cotton textile, jute textile and woollen textile industries in regard to which special studies have been made recently. The backlog of replacements in these three industries alone has been estimated at about Rs. 169 crores. The estimate that investment on replacement account in the Third Plan will be of the order of Rs. 150 crores is more or less a projection of the actual performance during the Second Plan. Even so, it is on the optimistic side in view of (a) the pressure on the available resources of private enterprise and institutional agencies for new investment and (b) the fact that mills with large backlogs of replacement are in no position to provide resources for renovation commensurate with needs and (c) the small allocation made in the Plan to enable the N.I.D.C. to assist these programmes financially.

22. It is necessary to emphasise that in the case of several projects the estimates of cost, on the basis of which the overall figures have been calculated, lack at this stage the required degree of precision, since these projects are in very preliminary stages of formulation in respect of scope, processes, location and other relevant particulars. Further, some of them fall under industries about which no experience is available in the country which might facilitate more accurate estimates. The estimates of foreign exchange requirements have been made on the assumption that payments will be made in cash and that, broadly, machinery and equipment will be obtained from the cheapest sources of supply. These estimates will be vitiated if changes have to be made in these underlying assumptions. For instance, the estimates will go up considerably if, in order to utilise the credits that have been made available by different countries, a large part of the equipment has to be obtained from sources which are not the cheapest.

23. As compared to these estimates of requirements, the resources available both for the public and the private sector programmes are expected, on present reckoning, to be deficient. The current allocations for industries and minerals in the public sector and the estimates of resources likely to be available for private sector programmes amount

these miscellaneous activities reckoned on an austere basis are shown in Annexure I.

30. *Industrial projects of State Governments.*—The major projects proposed for development as public sector undertakings by State Governments are shown in Annexure II. Many of these are spill-over projects from the Second Plan, e.g. the expansion of the Mysore Iron & Steel Works and of the Andhra Paper Mills, the doubling of the Durgapur coke ovens and the piping of gas from Durgapur to Calcutta. The major new projects of State Governments are the third stage expansion of FACT for additional production of ammonium phosphate, ammonium sulphate and ammonium chloride along with coordinated developments at Travancore-Cochin Chemicals, and the organic chemicals project of the Durgapur Industries Board for the manufacture of caustic soda, phenol, phthalic anhydride and some other organic chemicals.

31. Within the allocation for industries in the plans of State Governments, funds have to be found not only for the above projects but also for the State Financial Corporations and for the financing of industrial development area schemes. The latter are intended to contribute to the growth of industries in regions which are at present relatively backward industrially. The idea is to acquire in industrially backward regions suitable tracts of land at focal points where good communications exist or can be easily developed, to develop factory sites thereon, provide the basic facilities like power, water, sewage, etc. and then offer them for sale or on long lease to prospective entrepreneurs. The outlay proposed in the State plans for industrial development area schemes amounts to Rs. 5·4 crores.

PRIVATE SECTOR PROGRAMMES

32. *General observations.*—Under the Industrial Policy Resolution of April, 1956, a very extensive field of activity is open to private enterprise outside the Schedule A Industries which are reserved for the State. Private enterprise has not been slow to take advantage of these opportunities; reference has been made earlier in this Chapter to the buoyancy of manufacturing enterprise. It must not, however, be forgotten that to this lively development of the private sector the large programme of public investment undertaken in the last ten years has very materially contributed both directly, by the provision of the necessary overheads, and indirectly, by stimulating demand and so creating an atmosphere favourable to industrial growth. The further large-scale public investment planned for the next five years is likely to maintain the same favourable conditions for the operations of the private sector; but these, of course, will have to fit themselves into the overall framework of industrial development and conform to the priorities outlined in paragraph 19 above. Moreover, shortages of foreign exchange and of power are likely to impose throughout the period of the Third Plan limitations on the free growth of the private sector such as have only begun to be seriously felt during the

most of these in category (2); at any rate considerable progress should be made with all these projects. But some of them e.g. the precision instruments project and the two heavy electrical projects are still only at the preliminary stage of formulation and their scope and content are yet to be defined. It is possible, therefore, that some of these projects may spill-over to some extent into the Fourth Plan. Obviously, the largest element of uncertainty attaches at present to those projects falling in category (3). Some of these, however, e.g. the alloy steel plant, are of very high priority and every thing possible will have to be done to expedite them.

26. The industrial programme for the Third Plan takes into account the contribution towards meeting civilian needs that can be expected from expansions envisaged by the defence establishments in the field of alloy steels, tractors, trucks, electric equipment, nitrocellulose and chemical products. The possibilities in this regard are expected to be exploited by making full use of the capacity in the ordnance factories with a view to maximising and diversifying production and achieving consequent investment economies.

27. The major industrial projects in the public sector included in the Third Plan are in the field of iron and steel, industrial machinery, heavy electrical equipment, machine tools, fertilisers, basic chemicals and intermediates, essential drugs and petroleum refining. These are briefly reviewed later in this Chapter under individual industries along with developments in the private sector in allied groups of industries.

28. *Financing of Central Government projects.*—Although, as in the Second Plan, the bulk of the funds required for industrial projects in the public sector will be found by Government, quite considerable contributions are likely to be made by some undertakings from their own internal resources. Thus, based on the forecasts of production from public undertakings, it is estimated that about Rs. 300 crores will be available from their internal resources for financing industrial investments. The bulk of this amount will be contributed by the steel plants and fertiliser factories established in the public sector. It is also proposed that the Hindustan Machine Tools should set up one or two new machine tool works under its aegis, financed mainly from its own internal resources in respect of rupee expenditure.

29. *Assistance to institutional agencies and other miscellaneous requirements.*—The Central Government's plan for industries has also to take into account the resources required to be made available to the Industrial Finance Corporation and the National Industrial Development Corporation to enable them to operate at somewhat higher levels than in the Second Plan. Provisions have also to be made for plantation industries, the National Productivity Council, the Indian Standards Institution and the extension of the metric system. The financial requirements of all

short of the targets. Much will depend on the success attained in securing foreign collaboration and investment in industries where these are felt to be desirable. An endeavour will, however, be made to ensure the full achievement of targets in the case of industries of high priority. To this end, it is intended that the industrial programmes should be regularly reviewed and allotments of foreign exchange/credit made every six months for individual industries in the light of the progress achieved and the priorities which may suggest themselves from time to time. In this way it is hoped to achieve balanced progress.

36. In determining priorities, an important consideration will be the contribution an industry can make towards mitigating the pressure on foreign exchange either through a reduction in the level of imports or through additional exports. Thus industries which will directly save or earn foreign exchange will be given priority over industries which would only contribute to an increase in the supply of manufactured goods for the home market. In estimating import savings more stringent criteria will have to be applied than hitherto.

Main Features of the Industrial Programme

The salient features of the development programmes of major industries in the Third Plan are discussed in the following paragraphs:

Metallurgical Industries

37. *Iron and steel.*—The overall targets proposed under this industry are 10·2 million tons of steel ingot capacity and 1·5 million tons of pig iron for sale. The estimates of requirements of pig iron and of finished steel by 1965-66, which have provided the background for the planning of this industry, are indicated below along with the figures of the installed capacity available at the start of the Third Plan. A basic assumption made in connection with the demand forecast is that the current selling price of steel will hold good for the Third Plan period.

Table 5: Category-wise break-up of demand for iron and steel

(000 tons)

end-product of steel	estimated demand by 1965-66	capacity in existence in early 1961
heavy rails and fishplates	400	345
heavy structurals and broad flanged beams	550	445
sleepers and crossing sleepers	200	180
medium and light structurals	550	680
rounds and flats including rounds for nuts, bolts and screws	2200	1305
tin plate	300	150

closing years of the Second Plan. Whereas during the Second Plan several of the original industrial targets were raised, in the Third Plan any revision of the industrial targets would have to be considered from the point of view of a totality of circumstances, including foreign exchange, domestic resources, transport, power supply and trained personnel as well as the priorities laid down in the Plan.

33. With a view to formulating capacity and production targets for the Third Plan, the Planning Commission had discussions with representatives of various industries prior to as well as following the publication of the Draft Outline in June, 1960. The Commission has also had before it the recommendations made by Development Councils and by other agencies who had been requested to consider the targets for specific industries. On wider issues, such as the financial resources likely to be available to the private sector for investment during the Third Plan, discussions have also been held with premier industrial and commercial organisations of the country.

34. The statement at the end of the Chapter (Annexure III) shows the targets proposed for various industries under the Third Plan. These are overall targets for both the public and private sectors. For the engineering industries they are based on utilisation of installed capacity on double shift operation.

FINANCING OF PRIVATE SECTOR PROGRAMMES

35. Sources of supply of investible funds for financing gross fixed assets formation in the private sector during the Third Plan period and the quantum available from each source are estimated as follows:

Table 4: Sources of supply of funds for industrial and mineral programmes of the private sector

(Rs. crores)

sources	Third Plan period
institutional agencies	130
direct loan participation by Central and State Governments and other assistance	20
new issues	200
internal resources (net of repayment liabilities)	600
direct foreign credit participation in capital	300
total	1250

According to these estimates the funds likely to be available fall short of the requirements of the private sector programmes which are estimated to amount to Rs. 1350 crores. Apart from the overall shortage of financial resources, there is the still more difficult problem of finding the foreign exchange required for achieving all the targets. This is estimated to amount to not less than Rs. 530 crores. Foreign aid or credit to meet these requirements in full is not at present in sight. It cannot be said at this stage in which specific industries the actual performance will fall

40. The Neiveli pig iron project on which considerable preliminary investigations have still to be conducted in regard to the process as well as the raw materials intended to be used, represents an intermediate stage towards the establishment of a steel plant of about 0·5 million tons in the Southern region. The financial provision included for this scheme in the Third Plan covers mainly the requirements of a high temperature carbonisation plant for the production of lignite coke.

41. The expansion programme of the Mysore Iron and Steel Works comprises mainly the spill-over expenditure on the ferro-silicon plant and provision for steel making by the L.D. process and for a light structural mill.

42. The layout of the new steel plant at Bokaro is being planned for a capacity of two million tons of steel ingots, but in the first phase of development it is proposed to instal facilities for the production of one million tons. This plant is expected to specialise in the production of different types of flat products. The exact types to be produced in the first phase and the nature of the finishing facilities to be provided therefor are currently under examination.

On the completion of these development programmes, the capacity for mild steel of the public sector steel works will be raised from three million tons to seven million tons, making along with the capacity of the private sector a total of 10·2 million tons of ingots.

43. The overall investment required for the public sector steel development programmes included in the Third Plan is estimated at Rs. 525 crores. This is inclusive of the investments required for increasing the production of limestone at Nandini and iron ore at Dalli Rajara and Barsua in the case of the expansion programmes. It also includes the investments required for the additional production of coal and iron ore for the Bokaro steel plant and the expenditure on townships at all the four steel works.

44. The total production of finished steel in the country during the Third Plan period is tentatively estimated to be of the order of 24·1 million tons inclusive of an output of 0·3 million tons from the Bokaro steel plant in 1965-66. The annual break-up of production is visualised as follows:

Estimate of finished steel production

year	million tons
1961-62	3·5
1962-63	4·0
1963-64	4·3
1964-65	5·5
1965-66	6·8
total	24·1

end-product of steel	(000 tons) estimated demand by 1965-66	capacity in existence in early 1961
plates 3/16" and up	650	300
wires including wire ropes	400	220
hoops and box strapping	50	45
sheets	1200	740
strips & skelp for tubes	400	188
forging blooms & billets	300	132
wheels, tyres & axles	100	30
total	7300	4760
pig iron for sale	1500	660-870

38. The share of the private sector in the steel target is 3·2 million tons of ingots. The existing installed capacity of TISCO and IISCO is 3·0 million tons. The expansion of capacity for steel in the private sector is expected to come from the installation of scrap-based electric furnaces which will augment the supplies of billets to re-rollers. The supply of billets to re-rolling mills from the main producers of steel is visuatised at one million tons by the end of the Third Plan. As regards saleable pig iron, the output from the private sector is provisionally placed at about 0·3 million tons to be achieved through expansions of iron making capacity based on low shaft blast furnaces and/or electric smelting of iron ores.

39. As regards the public sector, rapid achievement of capacity output from the new steel plants whose construction was completed by 1960-61 will be the most important task in the initial years of the Third Plan. New developments included in the Plan comprise the expansion of the Bhilai, Durgapur and Rourkela steel plants and of the Mysore Iron and Steel works and the establishment of a new steel plant at Bokaro. In addition there is included in the Plan a project for a pig iron plant based on low shaft blast furnance techniques and the use of coke from the Neiveli lignite. The levels of capacity to be reached under these programmes are:

scheme	(million tons) target steel ingots	capacity pig iron
(a) expansion of :		
Bhilai	2·5	0·3
Rourkela	1·8	..
Durgapur	1·6	0·3
Mysore iron and steel works	0·1	..
(b) Bokaro steel project	1·0	0·35
(c) Neiveli pig iron project		capacity to be still decided

end-product pattern of the public sector project to be established at Durgapur.

Table 6: Projection of demand for alloy tool and special steels

(tons of finished steel exclusive of electrical steel sheets, spring steels and free cutting steels)

	1965	1970	output capacity of the Durgapur alloy steel project
tool steels	42000	70000	13000
constructional sheets	100000	241000	17500
stainless steels	50000	68000	17000
die and other alloy steels	8000	10000	500
total	200000	389000	48000

48. The projected Durgapur alloy steel plant will incorporate some of the latest equipment and processes for the manufacture of these products developed recently in advanced countries. Thus, it is proposed to instal electric soaking pits in preference to gas-fired pits. The desirability of using sponge iron instead of scrap as the starting raw material and of introducing continuous casting facilities is expected to be kept in view in connection with the further expansion of this plant. In the current phase of devleopment, it is planned that the plant should draw supplies of pedigree scrap from the adjoining Durgapur steel works. The outlay on the project is estimated at Rs. 50 crores in all of which Rs. 20 crores would be the foreign exchange element.

49. The ordnance factories of the Ministry of Defence are expected to function as a second source of supply of alloy steels in the public sector. The combined output of the Ishapur and Kanpur ordnance factories, mainly in the category of constructional steels but including some output of spring steels as well, is estimated at 50,000 tons.

The rest of the development in this industry is envisaged in the private sector where additional production facilities will be planned having regard to the deficits in different categories of these products still outstanding.

50. *Aluminium.*—In the field of non-ferrous metals, aluminium is expected to continue to retain its dominant position. The target of 87,500 tons set for 1965-66 is expected to be achieved as a result of the following projects in the private sector which have already been cleared for implementation:

(1) Expansion of the Indian Aluminium Company's plant at Hirakud by 10,000 tons per annum and the Alwaye plant by 5000 tons per annum;

On the basis of the above forecast of production and of the tonnages of different end-products likely to be available, shortages are expected to be significant, particularly in the initial years of the Plan period, in the case of flat products, e.g. tin plate, sheets, skelp and plate. This will call for the formulation of a scheme of priorities for determining the quantum of imports and allocation of flat products to different classes of consumers. Prima facie, it should be possible to narrow down the margin between the demand and the indigenous supply of steel products in short supply by free inter-change of steel ingots between the public sector plants so as to achieve the most intensive use of the rolling mill facilities for flat products. This possibility should receive attention in production planning in the light of the situation that may obtain from year to year.

45. The output of the main producers of steel will include electrical steel sheets produced by TISCO and at Rourkela. Similarly finished steels turned out by the producers operating on electrical furnace billets and by the ordnance factories will include spring steels and free-cutting steels. The level of production of these special varieties of mild steel will be related to the demand estimate for 1965-66 placed at 75,000 tons for spring and free-cutting steels and 70,000 tons for electrical steel sheets.

46. *Tool, alloy and stainless steels.*—The Second Five Year Plan envisaged the establishment of an alloy, tool and special steels plant in the public sector. Preliminary project reports for a plant of 25,000 tons annual output in terms of different finished products were received in 1958 from some of the leading producers abroad. Action on the implementation of this scheme was delayed as a result of the decision taken to get a more detailed project report the scope of which was modified in the course of its preparation, to facilitate the establishment of a more viable unit in line with the higher levels of demand for alloy steels visualised under the Third Plan. After the receipt of the report from the consultants in July, 1960, it was decided in November, 1960, to establish at Durgapur an alloy and tool steels plant of 48,000 tons annual output with built-in capacity in certain primary units so that it could be rapidly expanded to 100,000 tons.

47. The current heavy demand for imports of these high priced but essential raw materials of the engineering industires is a serious problem on maintenance account. The manufacture of tool, alloy and stainless steels has, therefore, to be assigned very high priority in the Third Plan from the point of view both of the requirements over the five-year period and of the probable long-term growth of demand for these products. The demand estimates for 1965 and 1970, which have been kept in view as a guide for planning in this field, are indicated below along with the

will mainly concentrate on projects for the production of heavy machinery and heavy machine building. Apart from this, targets have been proposed within this field, to be achieved mainly by private enterprise, in respect of an extensive range of manufactured items, i.e. agricultural machinery and constructional equipment like tractors, diesel engines, road rollers, dumpers and shovels; power distribution and measuring equipment like transformers (below 33 KV), electric cables and wires, and house service meters; rail and road transport items like locomotives, wagons, passenger coaches, commercial vehicles (buses and trucks); complete plants for the setting up of new units for the sugar, paper, cement and textile industries and certain chemical industries, steam-raising equipment (boilers) and machine tools, consumable stores like welding electrodes and durable consumer goods like passenger cars, sewing machines, bicycles and electric fans. These targets do not, however, cover all lines of expansion.

55. The production of new items in this field, of which various types of machinery are the most important, is expected to be developed both in independent plants specially established for the purpose like the A.V.B. (Associated Cement-Vickers-Babcock Wilcox) plant at Durgapur for the manufacture of equipment for the cement industry and high pressure boilers, and also by the diversification of the output of engineering workshops already in operation or currently under establishment. In the latter case, the investment required for developing the production of new items of machinery will be substantially lower than would otherwise be the case. This is the explanation for the apparently low estimates of investments vis a vis estimates of output in certain industries. In some of the manufacturing programmes, there is also the practice of entrusting the production of certain components to ancillaries or even major establishments with surplus capacities. In the circumstances, the normal relationship between output and investment cannot be applied.

In the following paragraphs the programmes in the principal sectors of the engineering industries are briefly outlined.

Foundry and Forge Shops for Castings and Forgings

56. Foundry/forge capacity is of crucial importance for the machinery manufacturing programmes. Within the overall targets set for this field in the Third Plan—1·2 million tons of grey iron castings, 200,000 tons each of steel castings and forgings—the accent in the public sector programmes is largely on production in the higher tonnage ranges for heavy machinery manufacture. The facilities which are being planned in the public sector projects are as follows:

Capacity for 45,000 tons of steel castings, 38,000 tons of grey iron castings and about 70,000 tons of steel forgings will be created in the

(2) Establishment of a smelter at Rihand of 20,000 tons annual capacity;

(3) Establishment of a smelter at Koyna of 20,000 tons annual capacity;

(4) Establishment of a smelter near Salem of 10,000 tons annual capacity; and

(5) Expansion of the plant of the Aluminium Corporation of India by 5000 tons per annum.

51. In the context of the rising demand for electrolytic copper and the relatively meagre possibilities of substantially increasing its domestic production during the Third Plan, further expansion of capacity for aluminium production appears prima facie desirable. The amount of such expansion would mainly have to be determined by the pace at which it is considered feasible from the technological angle to substitute aluminium for copper over the next five years, though the possibility of exporting aluminium would also be a relevant consideration. The additional foreign exchange needed for developing further capacity would be quite considerable if, as seems almost certain, arrangements have also to be made for the connected power facilities. The attractiveness of new proposals for further expansion of aluminium production would depend largely upon the extent to which they can provide for these additional foreign exchange requirements.

52. *Copper.*—The production of electrolytic copper will commence in the early years of the Third Plan with the commissioning of the unit at Ghatsila by the Indian Copper Corporation. The smelter and the electrolytic refinery associated with the Khetri and Daribo copper mines for an annual production of 11,500 tons of electrolytic copper are likely to be established by the middle of 1964.

53. *Zinc.*—The production of zinc for the first time in India is expected to be achieved by the middle of the Third Plan period with the commissioning of the zinc smelter based on zinc concentrates from the Zawar Mines in Rajasthan. The annual capacity of the plant will be 15,000 tons. It is also being equipped to operate a by-product sulphuric acid plant based on the smelter gases which will be used for the manufacture of phosphatic fertilisers.

Engineering Industries—Heavy and Light

54. Large-scale developments are proposed in this sector in view of the prospects of increased supplies of pig iron and steel, the emphasis on machinery manufacture and the scope in many instances for wide employment opportunities in relation to investment. The public sector

at the rate of about one million tons annually. The expanded mining machinery project at Durgapur is being designed for an annual output of 45,000 tons of equipment. The three heavy electrical equipment projects are designed to ensure from indigenous sources a wide range of electrical equipment sufficient to enable power generation to be increased at an annual rate of two million kW per year from 1971 onwards. They will also produce heavy motors, rectifiers and control equipment. Manufacture of high pressure boilers for thermal power plants with an annual capacity of about 28,000 tons (2500 tons of steam per hour) is another heavy engineering project tied with assistance from Czechoslovakia. Though it was originally visualised as a part of a composite heavy electrical equipment project, it is now proposed to develop it as an independent plant specialising in manufacture of high pressure boilers.

60. The targets set for the production in the private sector of complete plants to meet the demands of cement, paper, sugar and cotton textile mills and the levels of indigenous content envisaged under each are as follows:

Table 8: Production targets for selected items of industrial machinery

(Rs. crores)

item	standard size of plant (tons per day)	number of plants	value of plants excluding electricals	indigenous content (per cent)
cement mill machinery	500	6 to 7	4·0 to 5·0	90
paper mill machinery:				
(a) large plant	50	4	6·5 to 7·0	70
(b) small plant	10	4		
sugar mill machinery	1000 to 1200 of sugar cane	14	10·0	85
cotton textile mill machinery:				
(a) spinning mill	12000 spindles		20·0	85
(b) composite mill	12000 spindles and 300 looms			
sulphuric acid plant	50	10	1·3	80

It is highly desirable that the targets set for 1965-66 in respect of machinery items should be achieved and on the basis of the indigenous content specified in each case. The consortium approach for the manufacture and supply of complete plants for factories by groups of firms in association—which has been adopted for the manufacture of sugar mill machinery—may facilitate a speedy advance in other fields also.

foundry/forge which is being set up at Ranchi. Further capacity will become available from foundries attached to the steel plants at Durgapur, Bhilai and Rourkela, to the Heavy Electrical Project, Bhopal, to the Mining Machinery Project, Durgapur, and to the Hindustan Machine Tools. A steel foundry is under construction at the Chittaranjan Locomotive Works. The total capacity expected to be created in the public sector as a result of these schemes is as follows:

Table 7: Capacity for castings and forgings in the public sector

(figures in tons)

	grey iron castings	steel castings	steel forgings
Foundry/Forge project, Ranchi (III stage)	38000	45000	69700
Durgapur Mining Machinery Plant (30000 tons capacity for mining machinery)	11000	6000	7000
Hindustan Machine Tools, Bangalore	6000	..	..
steel plants :			
Durgapur, Bhilai, Rourkela	75000	15000	..
Chittaranjan Locomotive Works, Chittaranjan	3000	10000	..
others (including foundries attached to railway workshops)	6000	...	...
total	139000	76000	76700

Castings and forgings will also be required by several other machinery projects in the public sector included in the Third Plan, but a clear picture of these requirements and the best arrangements for meeting them, i.e. whether through captive foundry/forges or through independent units, or a combination of both will only emerge when the project reports are received.

57. A substantial part of the new capacity in the private sector is expected to come up as the result of demand stemming from the expansion of the automobiles industry and the manufacture of machinery for textiles, cement, sugar, paper and similar capital goods industries.

Industrial Machinery

58. The principal projects of the public sector in this field are the Heavy Machinery Plant near Ranchi; the Mining Machinery Project, Durgapur; the Heavy Electrical Equipment Plant, Bhopal and two other heavy electrical projects for which locations are currently under study by an expert committee.

59. The heavy machinery plant, which is being set up near Ranchi, on its expansion to 80,000 tons output per year will be able to supply the bulk of the equipment required for adding to steel making capacity

SHIPBUILDING

65. The programmes under this head include the expansion of Hindustan Shipyard Ltd. and the construction of a drydock at Vishakhapatnam. With the completion of these developments, the Visakhapatnam shipyard will be capable of producing ships of a total tonnage of 50,000–60,000 D.W.T. per year.

A second shipyard at Cochin and a scheme for the manufacture of marine diesel engines form part of the public sector programme. The former is estimated to cost Rs. 20 crores and the latter Rs. 5 crores.

66. Manufacture of smaller vessels for coastal and river traffic, tugs and boats and propelling machinery therefor will continue in the private sector. Construction activity will be mainly on a jobbing basis and no specific targets have, therefore, been fixed for these 'custom-built' items.

STRUCTURAL FABRICATION

67. As against the current structural fabrication capacity estimated at 500,000 tons, inclusive of the capacity of wagon builders, the target for the last year of the Third Plan is visualised at 1·1 million tons. The accent is expected to be much more on developing fabrication facilities for heavy structurals than has been the case in the past. Allied to these structural shops, facilities for the manufacture of items like pressure vessels, heat exchangers and other types of chemical plant and equipment are envisaged to be developed through the establishment of heavy plate and vessels works. The manufacture of cranes is another important line of allied activity.

68. In the public sector plan, detailed proposals have been worked out for a heavy structural works and a plate and vessel works to be established at a single location in the Nagpur-Wardha area. The former would have a capacity of 10,000 tons and the latter 18,000–20,000 tons per year on single shift basis. Together, these plants are estimated to cost Rs. 10·1 crores.

INDUSTRIAL AND POWER BOILERS

69. In addition to the capacity to be developed in the public sector under the Czech-aided heavy electrical project, facilities for the production of boilers for power plants as well as for meeting the steam raising demand of different industries are planned for development in the private sector. The value of the output of boilers in 1965-66 is envisaged at Rs. 25·0 crores.

MACHINE TOOLS

61. Exclusive of the contribution from the small-scale sector reckoned at about Rs. 5·0 crores, the target for machine tools is envisaged at Rs. 30 crores worth of output by 1965-66 as against an estimated production of Rs. 7 crores on the same basis in the last year of the Second Plan. Though there would thus be nearly a three-fold increase of output, this target of production falls substantially below the Rs. 50 crore level of yearly demand forecast for machine tools by the end of the Third Plan. There are physical limitations to a bigger step-up of production in this field arising from the large demand for skilled labour and the wide diversity in the categories of machine tools required. This is, however, a field of high priority where further developments should be undertaken, if feasible.

62. In the public sector, it should be possible within the foreign exchange arrangements so far made to proceed at once with the expansion of Hindustan Machine Tools, Jalahalli (HMT) and Praga Tools, Hyderabad, and with the establishment of a new heavy machine tools plant near Ranchi and one more machine tool works of the same size and type as HMT to be located in Punjab. It is estimated that the combined output of these machine tool works in the public sector inclusive of the contribution expected from the proto-type factory, Ambernath, of the Defence Ministry, will rise to about Rs. 15·0 crores.

63. The expansion programmes in the private sector will broadly have to be complementary and supplementary to the public sector plans and formulated against the background of the demand forecast for the different groups and families of machine tools.

RAILWAY ROLLING STOCK

64. In this field the most important development in the public sector will be the diversification of the Chittaranjan Locomotive Works so as to include the production of electric locomotives. The traction motors for these electric locomotives are proposed to be manufactured at the Heavy Electricals Ltd., Bhopal. The project for the manufacture of diesel electric and diesel hydraulic locomotives included in the Railway Plan will make a major contribution towards the achievement of self-sufficiency in respect of railway equipment. The Rs. 12 crore diesel loco project will have an annual capacity of 140 units with a turnover value of Rs. 10·0 crores. The diesel hydraulic engines would also make use of the Suri transmission, an improved design developed recently by an engineer of the Indian Railways which has been licensed for exploitation in West Germany. The private sector will continue to manufacture electric multiple coaches, wagons and meter gauge steam locomotives.

(d) Expansion of the Government Electric Factory, Bangalore.

(e) Heavy Compressors and Pumps project.

(f) Ball and Roller Bearings project.

(g) Surgical Instruments project, Guindy.

The precision instruments project is of fundamental importance in relation to future growth and covers new ground in a highly specialised field. Manufacture of control instruments and equipment with an ultimate annual turn-over of about Rs. 20 crores is envisaged under this project. The surgical instruments plant near Guindy has been planned for the manufacture of 25 groups of instruments valued at about Rs. 2·7 crores per year. The expansion of Hindustan Cables is, like the Diesel Loco Project, linked with the growing demands of Government in the field of communications.

Where no targets have been fixed for specific items in this as well as in other fields, developments are expected to be regulated by ad hoc reviews.

Chemical and Allied Industries

73. The largest and most important investment under this head during the Third Plan will be in the field of fertilisers. Large-scale development of nitrogenous fertilisers has become necessary as a result of the steep rise in the demand for them in connection with the agricultural programme and has been facilitated by the availability of waste gases from the petroleum refineries and coke-oven plants, the associated gas liberated in the mining of crude petroleum and, most important of all, petroleum naphtha. Naphtha has also given a fillip to organic chemical industries which have so far had to depend mainly on alcohol from molasses and acetylene from carbide. A favourable climate for the production of organic intermediates has been created by the recovery of organic hydrocarbons, e.g., benezene, toluene, naphthalene, anthracene and xylene which is expected to be further stepped up in the public sector *pari passu* with the increased coking of coal at the steel plants. The extraction of some of these hydrocarbons is considered feasible at some of the petroleum refineries by marginal modifications and additions.

The programmes of some of the major industries falling under this head are briefly described below.

Inorganic Chemicals

74. *Fertilisers.*—The demand for nitrogenous and phosphatic fertilisers is expected to expand to about one million tons in terms of nitrogen and

Automobiles and Ancillary Industries

70. The levels of development proposed for these industries are broadly in keeping with the recommendations made by the ad hoc Committee on the Automobile Industry in its Report of March, 1960 and by the Development Council for Automobiles and Ancillary Industries. The capacity targets in respect of all the items conform to the minimum targets recommended by the Development Council with the exception of passenger cars, for which a lower figure as proposed by the Ad-Hoc Committee has been accepted. The targets tentatively proposed for passenger cars, commercial vehicles, jeeps, motor cycles and scooters are:

	number
passenger cars	30000
commercial vehicles	60000
jeeps and station wagons	10000
motor cycles, scooters and three-wheelers . . .	60000

The target for commercial vehicles includes 4000 units expected to be produced at the ordnance establishments.

71. To reach the targets of production of automobiles without excessive and continued strain on foreign exchange resources, it will be necessary to achieve at least 85 per cent indigenous content by 1965-66 as compared with less than 60 per cent. at the start of the Third Plan. Investment designed to increase the indigenous content has to take precedence over investment for establishing new units or expanding existing capacity. Priority has also to be given to the production of commercial vehicles. Exclusive of the investment on facilities for producing castings and forgings to meet the full requirements of the automobile industry, the direct investment in this field vis-a-vis the targets is placed at about Rs. 85 crores with a foreign exchange element of Rs. 40 crores. Even more important than the direct investment is the demand for foreign exchange on maintenance account which for the Third Plan period, as a whole, has been estimated at Rs. 175 crores.

Other Engineering Industries

72. With the exception of the following projects in the public sector, the expansion of capacity under other engineering industries vis a vis the targets in Annexure III to this Chapter is expected to be secured through the efforts of private enterprise:

(a) Precision Instruments project.

(b) Expansion of Precision Instruments Factory, Lucknow.

(c) Expansion of Hindustan Cables, Rupnarainpur.

76. The capacity in the public sector by the end of the Third Plan is at present expected to be about 730,000 tons as shown below:

Table 10: Capacity for nitrogenous fertilisers in the public sector

	(tons of N)
existing capacity (Sindri, Nangal, FACT)	217000
Rourkela	120000
Neiveli	70000
Trombay	90000
Nahorkatiya	32500
further expansion of FACT	40000
Gorakhpur	80000
one more fertiliser plant in the public sector	80000
total	729500

As a general rule, the size of the new plants will be fixed at 70,000 to 80,000 tons of nitrogen in order to provide guidance and facilitate the planning of the manufacture of fertiliser plant equipment.

77. Under straight phosphatic fertilisers, a capacity of 200,000 tons in terms of P_2O_5 has already been planned. No further expansion of capacity is envisaged in terms of superphosphate.

78. The production of nitrogenous and phosphatic fertilisers is expected to be somewhat as follows during 1961-66:

Table 11: Estimates of production of Nitrogen and P_2O_5

(000 tons)

	N	P_2O_5
1961-62	140	100
1962-63	200	150
1963-64	300	225
1964-65	500	300
1965-66	800	400

The overall investment and the foreign exchange cost of the fertilisers programme on capital account are estimated at Rs. 225 crores and Rs 100 crores respectively.

79. *Sulphuric acid.*—As a major barometer of industrial activity, the target of 1·75 million tons set for sulphuric acid provides an indication of the tempo of all-round expansion planned. The growth of sulphuric acid production in the public sector is visualised in conjunction with fertiliser production, by-products recovery and pickling operations at the steel plants, pertroleum refining and manufacture of organic intermediates and drugs, and uranium extraction from the ores. The overall demand for the acid in the public sector by 1965-66 is expected

400,000 tons in terms of P_2O_5 by 1965-66. In the case of phosphatic fertilisers the end-product will have to be at least 50 per cent water soluble in order to meet the requirements of the users. In the case of nitrogen, the following end-product pattern forms the basis for production planning:

Table 9: End-product pattern for nitrogenous fertilisers

	(000 tons of N) 1965-66
ammonium sulphate	230
ammonium sulphate-nitrate	30
nitrochalk and nitrolimestone	160
nitrophosphate complex fertilisers	45
urea	305
ammonium phosphate	200
ammonium chloride	30
total	1000

It will be seen from the above that a significant portion of the additional output of nitrogen is being planned in the form of compound and/or complex fertilisers so that a part of the phosphate (P_2O_5) requirements will also be met simultaneously. The pattern of production is expected to keep within reasonable limits dependence on sulphur and gypsum.

75. In addition to the completion of fertiliser projects carried over from the Second Plan, it is proposed that further capacity for nitrogenous fertilisers should be established in the public sector by both the Central and some of the State Governments. At the time of the publication of the Draft Outline it was provisionally thought that the public sector capacity for nitrogenous fertilisers would be expanded to 800,000 tons and that the balance of 200,000 tons required to reach the target of one million would be provided by the private sector. It now seems probable that the private sector will undertake rather more than previously contemplated and that the capacity in the public sector by 1965-66 will be somewhat less than 800,000 tons. Applications from private enterprise have so far been approved, apart from the doubling of the Varanasi factory of Sahu Chemicals to 20,000 tons, for a plant at Ennore near Madras (8250 tons of N); in Madhya Pradesh (50,000 tons of N); at Vishakhpatnam (80,000 tons of N) and Kothagudiam (80.000 tons of N) in Andhra Pradesh; and in Rajasthan (80,000 tons of N). In addition, private enterprise in partnership with the West Bengal Government is expected to put up a fertiliser factory at Durgapur (58,000 tons of N).

It has also been proposed that fertiliser factories should be set up in Gujarat and Mysore, but their details are still being examined.

with private enterprise. The additional production required in order to reach the target for caustic soda is expected to be based on both the electrolytic and the chemical processes. The relative shares of the capacity for caustic soda, processwise, in the last years of the Second and Third Plans are:

	1960-61	(tons) 1965-66
chemical caustic	27000	50000
electrolytic caustic	97435	350000
total	124435	400000

The expansion of soda ash production is also expected to cover the production of heavy soda ash. An indication of the growth of capacity for heavy and light soda ash is given below:

	1960-61	(tons) 1965-66
soda ash (light)	220000	370000
soda ash (heavy)	nil	160000
total	220000	530000

83. *Miscellaneous.*—Apart from the major heavy chemicals whose programmes have been outlined above, the Third Plan envisages specific levels of development for other products like titanium dioxide, calcium carbide, sodium hydrosulphite, sodium sulphate, potassium hydroxide and barium chemicals against the background of the expansion of demand.

ORGANIC CHEMICALS

84. Large-scale developments are envisaged in the field of organic chemicals almost for the first time. These may be said to have followed the build-up in the demand for many items as a result of the development of allied chemical industries over the last decade e.g. plastics, dyestuffs, drugs. New industries visualised in the Third Plan like nylon and terylene and further expansion in the existing lines over the next five years have been taken into account in fixing the levels of development appropriate in this field. The undermentioned targets for the three major items have to be regarded as provisional since it is not yet clear at what pace the industries which would be important

to be about 550,000 tons as against a capacity of about 150,000 tons in existence in the public sector at the end of the Second Plan.

The break-up of the estimated consumption of this acid in 1960-61 and the requirements in 1965-66 are assessed as follows:

(000 tons of sulphuric acid)

	estimated consumption in 1960-61	estimated requirements in 1965-66
fertilisers	210	1090
steel works	26	30
rayon and staple fibre	59	135
sulphates and other inorganic salts	24	40
petroleum refining	8	20
miscellaneous	33	185
total	360	1500

80. Whereas the production of sulphuric acid has so far been based on sulphur, a part of the capacity proposed to be set up in the Third Plan period will be linked with by-product smelter gases (zinc and copper smelters) and with pyrites from the Amjor deposits in Bihar. The pyrites-sulphuric acid plants, if established in conjunction with large-scale fertiliser plants near the steel works at Durgapur and Bokaro, could find a profitable outlet for the 'spent oxide' for use in the sintering of iron ore.

81. *Sulphur.*—It has been estimated that the consumption of sulphur will increase from about 175,000 tons in 1960-61 to about 600,000 tons inclusive of the sulphur equivalent of pyrites and by-product smelter gases in the last year of the Third Plan. With the development of new sources of sulphur supply in other countries, no serious rise in the import price of this basic industrial raw material is anticipated. Even so, it still remains important to establish some indigenous source of sulphur. A major effort at tackling this problem will be made during the Third Plan. A public sector project has been included in the Plan for the recovery of sulphur from pyrites (vide Chapter XXVII para 50).

82. *Caustic Soda and Soda Ash.*—The targets for these chemicals are based on meeting the estimated requirements for 1965-66 in full from indigenous sources. With the exception of the expansion programme of Travancore-Cochin Chemicals and the organic chemicals scheme of West Bengal, the development in these two industries rests entirely

present indications it is likely to be in a position to undertake a throughput of approximately 3·5 million tons of crude oil during the Third Plan period. The estimated requirements of end-products by 1965 and the expected output of the refineries in operation and under construction are presented in the following Table:

Table 12: Estimated requirements of petroleum products

(000 tons)

end products	estimated requirements by 1965		refineries in operation (private sector)	refineries under construction (public sector)	total production*	deficit or surplus
	as given in Draft Outline	as estimated by Oil Advisory Committee in March, 1961				
kerosene . .	2200	2660	916	366	1282	—1378
high speed diesel oil . . .	1800	2607	1064	514	1578	—1029
motor spirit .	1300	1123	1023	514	1537	+414
aviation turbine fuel (ATF) .	300	408	..	189	189	—219
aviation spirit .	60	53	..	10	10	—43
furance oil .	2200	2753	1619	311	1930	—823
light diesel .	700	872	511	208	719	—153
bitumen . .	700	628	394	120	514	—114
jute batching oil	100	80	47	..	47	—33
vapourising oil, mineral turpentine, solvent oil, paraffin wax	106	130	46	..	46	—84
lubricants .	500	409	21	50	71	—338
total . . .	9960	11723	5641	2282	7923	—4214 +414 (motor spirit)

87. The requirements of furnace oil might prove to be higher if fiscal incentives are given to encourage industries in areas far removed from the coal fields to change over from coal to fuel oil. This matter is under examination.

88. In common with several other countries, India will face the problem of imbalance between the output of motor spirit (gasoline) and the demand for it. While exports have so far provided an outlet for surplus motor spirit, the disposal of it, in this manner, is expected to become more and more difficult with the all-round expansion of refining capacity in neighbouring countries. The solution to the

*This does not include the production from the refinery in Gujarat.

customers for the products and are to be established in the country for the first time, are likely to develop.

	(tons) capacity target for 1965-66
phthalic anhydride	15000
phenol	15000
methanol	40000

Manufacture of plastic monomers, vinyl chloride and styrene, butadiene, carbon black and rubber chemicals, butyl alcohol and its esters, citric acid and oxalic acid, which are proposed to be undertaken for the first time in the private sector, deserves mention in this connection.

85. Major developments are also envisaged in the public sector through the Basic Chemicals and Intermediates (BCI) plant near Panvel in the Maharashtra State. The B.C.I. project as the supplier of intermediate chemicals, is firmly linked with the synthetic drugs project proposed for establishment at Sanatnagar near Hyderabad. As a result of these two projects, valuable technical know-how in a virgin field is expected to become available during the Third Plan period. The programme under the BCI project covers the manufacture of 40 organic intermediates with an aggregate output of 25,160 tons. Provision is also being made for further expansion in due course by about 15,000 tons. Several basic inorganic chemicals are consumed in the manufacturing operations which include inter alia chlorination, sulphonation, alkaline fusion, nitration, reduction and oxidation. The manufacture of some of these inorganic chemicals is also envisaged in captive plants within the project.

Petroleum Refining

86. A project report is to be obtained with a view to establishing in the public sector a plant for the manufacture of high viscosity index lubricating oil products. Government are also considering a proposal for establishing a plant for this purpose in association with private enterprise. Apart from this, developments in the field of refined petroleum products are visualised entirely in the public sector. The programme includes the completion of the refineries under construction at Nunmati (Gauhati) and Barauni and the establishment of a third public sector refinery with an annual capacity of about two million tons of crude throughput in Gujarat. External credit and technical assistance have been assured for this third refinery and the site for it is being selected. The product pattern of this refinery will have to be designed, as in the case of the Nunmati and Barauni refineries, to cover as far as possible the deficits in kerosene and diesel oil. Every effort is being made for the construction of the refinery by the middle of 1964, and on

The public sector projects in this field which are estimated to involve a combined outlay of Rs. 27·3 crores are:

(1) Synthetic Drugs Project at Sanatnagar, Andhra Pradesh, covering the manufacture of sulpha drugs, vitamins, phenacetin, other synthetic drugs (INH, luminal, chloroquin, etc.) and intermediates (including ASC at 1500 tons per year)—annual value of output, Rs. 6·4 crores.

(2) Antibiotics Plant near Rishikesh, Uttar Pradesh, covering the manufacture of penicillin, streptomycin, chloro and other tetracyclins, new antibiotics. Annual value of output, Rs. 26 crores.

(3) Phyto-chemical Plant in Kerala, covering the manufacture of caffeine, ephedrine, digitalis glycosides, lanatazides, ergot alkaloids, atropine, scopolemine, reserpine, papin, vitamin P-yearly output, Rs. 0·77 crores.

In connection with the manufacture of phyto-chemicals the establishment of modern drug farms has assumed crucial importance. Provision has been made in the Five Year Plan of some of the States for these related developments.

Plastics

91. Within the overall target of 85,000 tons set for plastic materials as a whole, pride of place has been assigned to polyolefines (polyethylene, etc.) their proposed share being 27,000 tons. Next in importance from the point of view of the rate of growth envisaged are polystyrene and polyvinyl chloride for each of which appropriate targets are being fixed. Polyethylene has a high priority as a lining material for bagging fertilisers on account of its high resistance to moisture. Ethylene of petro-chemical origin is expected to come into use as the raw material for its production on account of its price advantage as compared to alcohol. This is a field in which revision of the target might merit favourable consideration from the export angle as well as the potential of some of the plastics to provide substitutes for scarce materials like rubber and leather.

Soft Coke

92. The manufacture of soft coke from lignite at Neiveli at the rate of 380,000 tons per year is a major spillover scheme from the Second Plan. Development of further capacity is prima facie desirable in the context of the heavy denudation of forests that has been taking place from charcoal production. The public sector programme includes a proposal for the establishment of low temperature carbonisation plants for the production of soft coke. The approach to developments in this field is, however, flexible.

imbalance problem will have to be found by the adoption of the following methods:

(1) Technological measures to increase the production of middle distillates. There is, however, only a limited scope for varying the production pattern. The question of increasing the production of kerosene and H.S.D. by changing the specifications in the flash point of these two products is being examined.

(2) Appropriate fiscal measures which will retard the growth of consumption of high speed diesel oil. This has been done to some extent in 1960-61.

(3) Promoting the use of mixed fuels which will reduce the demand for H.S.D. and at the same time increase the off-take of gasoline. Existing diesel vehicles could use mixed fuels containing upto 10 per cent gasoline without any changes being effected in them.

(4) The surplus of motor spirit can also be reduced or avoided by diverting the light distillate (naphtha) from which motor spirit is made to other productive uses such as production of nitrogenous fertilisers and petro-chemicals. Naphtha has already been decided upon as the feed stock for the fertiliser plants to be constructed at Trombay, Visakhapatnam, Gorakhpur and Ennore (near Madras) and for the third stage expansion of Fertilisers and Chemicals, Travancore.

89. The public sector programmes in this field also visualise a project for the fractionation of the Nahorkatiya natural gas to isolate the ethylene, butane and other aliphatic hydrocarbons and make them available to petro-chemical industries. The residual gases are proposed to be fed to the Nahorkatiya fertiliser project and the power plant planned for establishment close to the petro-chemical plants.

Pharmaceuticals and Drugs

90. A beginning has been made in the later years of the Second Plan in the diversification of the production of essential drugs in both the public and private sectors. This is illustrated by the arrangements for streptomycin manufacture by Hindustan Antibiotics Ltd., and the synthesis of vitamin A from lemongrass oil by two leading pharmaceutical establishments in Bombay. New developments in this field are projected by Government as well as private enterprise which are expected to ensure the availability of essential drugs at reasonable prices and based on indigenous raw materials.

The production of the latter will be developed by the National Instruments Factory, Calcutta. The interest of the public sector in the field of consumer goods will also be manifested through assistance afforded for the establishment and expansion of cooperative enterprises. Sugar and cotton spinning mills will continue to be the main beneficiaries of such assistance. The programmes and targets proposed for the major consumer goods industries under the Third Plan are briefly outlined below.

97. *Cotton textiles.*—The requirements of cotton textiles at the end of the Third Plan have been calculated on the assumption that 8450 million yards of cloth will be needed for domestic consumption and 850 million yards for export. The figure for domestic consumption provides for an increase of about 20 per cent over the estimated level of demand in 1960-61; in other words it allows for an annual increase of 2 per cent in population and 2 per cent in per capita consumption. For the purpose of this calculation, the demand in 1960-61 has been assumed to be about 7000 million yards. The actual availability of cotton cloth for domestic consumption that year was of the order of 6750 million yards, but this relatively low figure is believed to have been mainly due to a shortage of raw cotton consequent on a poor cotton crop in 1959-60 and cannot be taken to reflect the actual level of demand in 1960-61. This view is also supported by the high prices ruling for cotton cloth which have had a restrictive effect on the offtake. The figure taken for exports is not much higher than the average level prevailing during recent years, as for some time past exports have been stagnant and have not shown any decidedly upward trend.

98. Out of the total target for cotton cloth of 9300 million yards, 3500 million yards have been allocated as the share of the decentralised sector (handloom, powerloom and khadi). The production target allocated to the mill sector is 5800 million yards as against the current level of output and estimated effective capacity of about 5000 million yards. To achieve the additional production of 800 million yards in the mill sector, it is envisaged that about 25,000 automatic looms will have to be installed during the Third Plan.

99. On the basis of a cloth production target of 9300 million yards, and taking into account also the yarn required for purposes other than cloth weaving, e.g. hosiery and newar, the yarn production target has been fixed at 2250 million lb. To reach this target of 2250 million lb of yarn it will be necessary to increase the active spindleage of the mills to about 16·5 millions as compared to 12·7 millions at the end of the Second Plan. The addition that may be secured through the activisation of idle spindles as a result of modernisation programmes will ultimately

CEMENT

93. The capacity target for cement fixed at 15 million tons by 1965-66 represents about 50 per cent increase over the level expected to the reached by the end of the Second Plan. Recent trends in the demand for cement indicate that the estimated requirements for 1960-61 which were taken as the basis for the projections of growth, may have been somewhat on the low side. This matter is expected to be reviewed in another year. The possibility of having to revise the cement target upwards, if restraint on construction activities is not considered necessary or desirable, cannot be ruled out.

In view of difficulties in expanding the output of limestone in step with the full requirements of the cement industry, greater attention should be devoted to the use of granulated slag from the steel works. Not much progress was made on the use of blast furnace slag in cement manufacture during the Second Plan.

GLASS AND GLASSWARE

94. Important developments in this industry will be the manufacture of optical and ophthalmic glass. The former is of basic importance to the instruments industry and its manufacture is to be started during the Third Plan on the basis of the know-how and experience built up by the Central Glass and Ceramic Research Institute of the Council of Scientific and Industrial Research. Manufacture of ophthalmic glass is to be undertaken at Durgapur with aid from U.S.S.R.

RAW FILMS

95. The plant for the manufacture of raw films, X-ray films and sensitised papers proposed to be set up near Ootacamund in Madras State with the technical collaboration of M/s. Bauchet et Cie of France is a major public sector project falling in this field. The capital investment on the scheme and its turnover are estimated at Rs. 8 crores and Rs. 5 crores respectively. On reaching full production under its current phase of development, availability of these products is estimated at 4.8 million sq. meters of films and 1·5 million sq. meters of photographic paper.

CONSUMER GOODS INDUSTRIES

96. Programmes for the manufacture of consumer goods in the public sector occupy a relatively minor position in terms of direc investment in organised industries, the only exception being the manufacture of essential drugs discussed in para 90 above. Watches and cameras are two items of durable consumer goods projected for manufacture in the public sector with technical collaboration from Japan

103. The Security Paper Mill to be established at Hoshangabad with an annual capacity of 1500 tons envisages the production of specialised paper on the import of which a considerable amount of foreign exchange is at present expended.

104. In the case of newsprint, a five-fold expansion from 30,000 tons to 150,000 tons has been proposed in step with the anticipated growth of demand during the Third Plan period. Additional capacity is expected to be achieved through the doubling of the Nepa mills and through the establishment of new newsprint factories based on baggasse and on the soft woods available in the Himalayan region.

105. For the achievement of these targets, the paper and newsprint industries will have to depend upon new raw materials in place of bamboo which has so far been their mainstay. New industrial uses of bamboo, e.g. for rayon grade pulp will also accentuate the shortage of bamboo for the paper industry. While new plantation and replantation programmes can, to some extent, provide a long term solution, in the Third Plan the paper and newsprint expansion will have to depend heavily on the use of bagasse which is currently being used as fuel by the sugar mills. The diversion of bagasse to the paper industry will have to be based on providing the sugar mills with an alternative fuel.

106. *Sugar.*—In the case of the sugar industry, the stage of self-sustained growth has been reached by the beginning of the Third Plan as a result of the progress made in the manufacture of mill machinery in the country. A second major factor which would influence the pace of growth of this industry is the expected availability of sugarcane. The Third Plan has envisaged expansion of sugarcane output to 100 million tons mainly through improvements in yield per acre. After allowing for diversion of sugarcane for jaggery manufacture and other miscellaneous uses, about 35 million tons of sugarcane are expected to be available for sugar production. To cope with the crushing of these supplies in this seasonal industry, expansion of capacity to 3.5 million tons per year (in terms of gur) has been projected under the Third Plan. Cooperative industry during the Third Plan and it is estimated that their share of the enterprises are expected to make further progress under this overall mill capacity will rise to about 25 per cent. A provision of about Rs. 6 crores has been envisaged in the Plan for contribution by State Governments to the share capital of cooperative sugar factories.

Throughout the Third Plan period, the production of sugar in the country is expected to meet the demand in full and the surplus will be exported.

107. *Vegetable oils.*—In the case of vegetable oils, further expansion of production is largely dependent on the programmes for cultivation

determine the number of spindles required to be installed through new units and expansions. The implications of the general observations made in para 21 regarding investment on replacements have to be further examined and the contributions towards additional effective spindleage which may be obtained through modernisation programmes and through the establishment of new mills assessed on realistic basis. The estimated gross investment will, however, remain substantially the same whether the bulk of the additions to spindleage comes from modernisation or from new units. Out of the additional capacity for spindles and looms envisaged for installation during the Third Plan, it is proposed that a substantial proportion of the additional loomage shall be export—oriented.

100. *Rayon and staple fibre.*—The programme for the rayon and staple fibre industry in the Third Plan period envisages expansion of capacity from about 100 million lb (52.3 million lb of rayon filament and 48 million lb of staple fibre) at the end of the Second Plan to 215 million lb (140 million lb of rayon filament and 75 million lb of staple fibre). This expansion programme provides inter alia for an increase in the per capita consumption of rayon fabrics from 1·3 yards in 1960-61 to 1·8 yards in 1965-66. The overall target for rayon filament comprises 20 million lb of tyre cord yarn required for the automobile tyre industry, 76 million lb of viscose filament, 24 million lb of acetate yarn, 10 million lb of cuprammonium and 10 million lb of synthetics.

101. Considerable importance has been attached to the phasing of investments in this industry so as to reduce the burden on foreign exchange on current account. Thus it is proposed that expansion of capacity for the manufacture of rayon grade pulp should be given preference over further expansion of output of rayon filament and staple fibre. The position will have to be periodically reviewed so as to ensure that additional capacity in this field is created in step with the progress in the manufacture of the raw materials. The future planning of this industry, particularly staple fibre, will also be influenced by the extent to which it proves possible to increase the production of long staple cotton, since staple fibre can be regarded as a substitute for it.

102. *Paper and newsprint.*—The expansion programme of the paper and paperboard industry broadly conforms to the aim of achieving self-sufficiency in respect of this essential item. To meet the estimated demand of 700,000 tons by 1965-66, it is proposed to increase the capacity of the industry from the present level of 410,000 tons to 820,000 tons by the end of the Third Plan period. A sizeable proportion of the additional capacity to be established during the Third Plan period will take the form of small paper plants using local raw materials.

preparation of detailed project reports and the designing of structures. As regards designs development, though to begin with the fabrication of plant and equipment will necessarily be based predominantly on 'bought out' designs, the object should be to manufacture in the not distant future industrial machinery on the basis of indigenous designs. In the public sector, it is intended that the nucleus organisations functioning under Hindustan Steel Ltd., and Sindri Fertilisers and Chemicals should be rapidly expanded and similar agencies brought into being in an appropriate manner under other machinery projects. A central designs institute for machine tools is projected at Bangalore. Similar programmes should be accorded high priority in the private sector also and appropriate steps taken to push forward these programmes vigorously. Since performance guarantees are customary in this field, establishment of the necessary testing facilities will also become essential. A high voltage laboratory is being set up for the testing and design development of switchgear at Bhopal. This problem will have to be attended to by the private sector also wherever necessary.

110. Since the industrial sector has also to play its part in the export drive, thought and attention must be given not only to securing expansion of output but also to all factors that contribute to enhanced productivity and reduction of costs. As regards production costs, the high levels are partly attributable to factors capable of remedy, if the sizes of plants proposed for establishment are of optimum size and economic outlets for by-products and/or co-products as in the case of electrolytic caustic soda plants, are also developed. A high level of utilisation of capacity will be conducive to economies on overheads. These are aspects that should be continuously studied by Development Councils at the expert level.

111. Many of the heavy industries envisaged for development, e.g. steel plants, petroleum refineries, fertiliser factories require very large quantities of water for process use. Machine building projects, which give rise to concentration of industrial labour at the selected location, similarly demand largescale water supply facilities for potable and other township requirements, though the direct consumption in the processes is not considerable. In the studies undertaken by special committees entrusted with the task of recommending suitable sites for some of the major industrial projects included in the Third Plan, the availability of water has figured as a very material factor influencing the ultimate choice. It has been noted that several areas which are otherwise well suited for the location of heavy industries have had to be ruled out owing to lack of water on the scale demanded. Without long-term planning of water supplies, the opportunities for industrialisation in such areas will be thwarted. No less important is the problem of

of the five major oilseeds, viz., groundnut, sesamum, rape and mustard, linseed and castor. The production of these oilseeds is planned to be raised from an estimated 7·1 million tons in 1960-61 to 9·8 million tons by 1965-66. From the trends of consumption and the rate of population growth, it is felt that the availabilities of edible oil will not be adequate to provide for sizeable exports after meeting the internal needs in full. In order to augment the supply of vegetable oils, various proposals form a part of the overall programme, one of which is the expansion of the production of cotton seed oil to one lakh tons per year. The realisation of this target will depend on the success achieved in promoting the use of cotton seed cake as an animal feed instead of the whole seed and ensuring the offtake of the cotton linters as an industrial raw material. The additional production of cotton seed oil is largely to be used in the manufacture of vanaspati thereby relieving the pressure of demand on groundnut oil. Another important programme calculated to augment the vegetable oil resources which has been envisaged in the Plan, is to increase solvent extraction of oil cakes to 160,000 tons of oil per year from its current level of about 40,000 tons. Oil thus produced would be used chiefly for industrial purposes. Other subsidiary sources of supply of oil, though relatively of minor importance from the point of view of tonnage output, have also been borne in mind, e.g. rice bran oil. The overall production of vegetable oils inclusive of coconut oil is expected to amount to about 2·9 million tons by 1965-66.

Problems of Development and General Recommendations

108. The nature and levels of industrial development proposed under the Third Plan present a major challenge to both the public and private sectors in view of the manifold problems to be attended to in a limited period of time. Resources and foreign exchange, though important, are not the only problems which have to be tackled. Those involved in maintaining rising levels of production and at the same time carrying out the expansion of steel plants have been found by the two private sector companies to be quite complex and the fullest use must be made of their experience in overcoming the difficulties that may arise in expanding the public sector plants while at the same time bringing them to full production.

109. For machine building activities, which figure prominently in the public sector programmes, as well as for machinery manufacture in the private sector, designs development and project engineering are of paramount importance. In regard to the latter, which has been briefly referred to in paragraph 6, the N.I.D.C. is arranging to assume responsibilities with reference to its own public sector projects as well as those of the Commerce and Industry Ministry, and a Technological Consultancy Bureau was established by it in 1960-61. The functions of the Bureau will include preparation of preliminary studies, investigation and selection of sites,

ANNEXURE I

Third Five Year Plan

1. Industrial projects of Central Government

name of the scheme	location	total investment (Rs. crores)	foreign exchange component (Rs. crores)	capacity in 1965-66 (final capacity in the case of expansion)
A. projects under execution and carried over from the Second Plan (a)				
1 completion of the three steel plants	Rourkela Bhilai Durgapur	50·0	20·0	3 million tons of steel ingots and 700,000 tons of pig iron for sale.
2 Rourkela fertiliser factory	Rourkela			120,000 tons of nitrogen.
3 heavy machinery plant	Ranchi	80·0	55·0	45,000 tons of finished machinery.
4 foundry forge shop	Ranchi			94,000 tons of castings and forgings.
5 mining machinery plant	Durgapur			30,000 tons of mining machinery.
6 heavy electrical plant	Bhopal	16·0	7·0	Rs. 12·5 crores worth of electrical equipment.
7 drug projects		30·0	15·0	
(a) synthetic drugs plant	Sanatnagar (Andhra Pradesh)			Rs. 6·4 crores worth of drugs.
(b) antibiotics plant	Rishikesh (Uttar Pradesh)			Rs. 25·8 crores worth of antibiotics.
(c) phyto-chemicals plant	Munnar (Kerala)			Rs. 77 lakhs worth of phyto-chemicals.
(d) surgical instruments plant	Guindy (Madras)			Rs. 2·8 crores worth of instruments.
8 organic intermediates plant	Near Panvel (Maharashtra)	11·0	6·0	25,000 tons of organic intermediates.
9 expansion of Hindustan antibiotics	Pimpri (Maharashtra)	0·5	neg.	45,000 kgs. of streptomycin & 1·5 tons of tetracyclines.
10 Trombay fertiliser factory	Trombay (Maharashtra)	25·0	13·0	90,000 tons of nitrogen.
11 Nahorkatiya Fertiliser factory	Nahorkatiya (Assam)	12·0	7·0	32,500 tons of nitrogen.

32	Gujarat oil refinery	exact location not yet decided	30·0	15·0	2 million tons of crude oil
33	expansion of Praga Tools	Secunderabad (Andhra Pradesh.)	1·0	0·5	Rs. 1 crore worth of machine tools
34	heavy structural works	not yet decided	6·0	@	10,000 tons of heavy structurals on single shift basis.
35	heavy plate and vessel works	not yet decided		4·0	18,000—20,000 tons of chemical plant machinery on single shift basis
36	Gorakhpur fertiliser factory	Gorakhpur	18·0	8·0	80,000 tons of nitrogen
37	Security paper mill	Hoshangabad (Madhya Pradesh)	5·5	4·0	1500 tons of security paper
38	expansion of Hindustan Cables	Rupnaraianpur (West Bengal)	3·5	1·2	2,000 miles of dry core cables and 500 miles of plastic insulated city cables on double shift basis
			499·1	267·2	
	C. Other projects (b)				
39	Bokaro steel project	Bokaro	200·0	100·0	one million tons of steel ingots and 350,000 tons of pig iron for sale
40	alloy and tool steels plant	Durgapur	50·0	20·0	48,000 tons of finished products.
41	expansion of Bhopal heavy electrical plant	Bhopal	19·0	8·0	Rs. 25 crores worth of electrical equipment
42	expansion of Hindustan Shipyard (expansion and subsidy)	Visakhapatnam	10·0	1·5	50,000—60,000 DWT
43	dry dock project of the Hindustan Shipyard.	Visakhapatnam	2·0	0·5	
44	second shipyard	Cochin	20·0	5·0	
45	expansion of FACT	Alwaye (Kerala)	8·0	5·6	60,000 tons of nitrogen.
46	expansion of Nepa mills	Nepanagar (Madhya Pradesh)	4·0	3·0	60,000 tons of newsprint.
47	salt development.	not yet decided	3·0	0·8	scope yet to be decided
48	heavy compressors & pumps project	not yet decided	15·0	10·0	
49	ball and roller bearing project	not yet decided	8·0	6·0	2 million bearings
50	additional capacity for machine tools		15·0	10·0	scope yet to be decided
51	second heavy structural works		3·0	1·5	
52	second plate & vessel works	not yet decided			
53	marine diesel engine factory				
54	expansion and modernisation of the Govt. alkaloid factory.	Ghazipur (Uttar Pradesh)	0·4	neg.	
55	lubricating oil plant		12·0	6·0	100,000 tons of HVI Lubricants
56	low temperature carbonisation plants		22·0	15·0	2·2 million tons of coal

@According to the latest estimates these projects will cost Rs. 10·1 crores and will need foreign exchange expenditure of Rs. 6·4 crores.

ANNEXURE I—*contd.*

name of the scheme	location	total investment (Rs. crores)	foreign exchange component (Rs. crores)	capacity in 1965-66 (final capacity in the case of expansion)
12' Neiveli fertiliser factory	Neiveli (Madras)	15·68	11·56	70,000 tons of nitrogen
13 briquetting and carbonisation plant	Neiveli (Madras)	13·84	8 61	380,000 tons of carbonized briquettes.
14 Neiveli thermal power plant.	Neiveli (Madras)	9·67	5.86	250 MW
15 Nunmati oil refinery	Nunmati (Assam)	8·5	4·9	0·75 million tons of crude oil
16 Barauni oil refinery	Barauni (Bihar)	23·0	7·5	2·0 million tons of crude oil
		295·19	161·4	
B. new projects for which external credits are already assured, wholly or partly				
17 expansion of heavy machinery plant	Ranchi	14·0	11·0	80,000 tons of finished machinery
18 expansion of foundry forge	Ranchi	10·0	5·5	153,000 tons of castings and forgings
19 expansion of mining machinery plant	Durgapur	15·0	10·0	45,000 tons of mining machinery
20 second and third heavy electrical projects	not yet decided	69·0	45·0	scope yet to be finally decided in the case of the third project.
21 heavy machine tool project	Ranchi	11·0	9·0	Rs. 3-4 crores worth of machine tools
22 precision instruments project	not yet decided	8·0	6·0	Rs. 20 crores worth of instruments
23 ophthalmic glass project	Durgapur	2·6	2·0	300 tons of ophthalmic glass
24 raw film project	Ootacamund	8·0	5·0	6·3 million sq. meters of raw films, photographic paper etc
25 watch factory	Bangalore	2·5	1·5	360,000 watches
26 expansion of Bhilai steel plant	Bhilai	138·0	56·0	2·5 million tons of steel ingots and 300,000 tons of pig iron for sale
27 expansion of Durgapur steel plant	Durgapur	56·0	27·0	1·6 million tons of steel ingots and 300,000 tons of pig iron for sale
28 expansion of Rourkela steel plant	Rourkela	90·0	50·0	1·8 million tons of steel ingots.
29 expansion of Hindustan Machine Tools	Bangalore	3·0	2·0	Rs. 7 crores worth of machine tools
30 basic refractories project	Bhilai	3·0	1·5	Scope yet to be decided
31 new machine tool works in Punjab	exact location not yet decided	5·0	3·0	1000 machine tools (Rs. 3·5 crores)

ANNEXURE I—*contd.*

2. Mineral projects of the Central Government

(Rs. crores)

name of the scheme	total outlay	foreign exchange component
A. projects under execution and carried over from the Second Plan (a)		
coal		
coal programme of N.C.D.C.	8·00	..
washeries at Bhojudih, Patherdih and Dugda	7·50	4·00
	15·50	4·00
oil		
Oil India		
crude pipe line	8·00	..
share capital in Oil India	1·42	..
	9·42	..
lignite		
Neiveli lignite project		
mining scheme	3·29	1·30
housing	3·00	..
	6·29	1·30
iron ore		
Kiriburu	6·00	3·93
total	37·21	9·23
B. new projects for which external credits are already assured, wholly or partly (b)		
coal		
additional coal (17 m. tons) from N.C.D.C	57·00*	28·00
Singareni expansion (3 m. tons)	20·00	6·00
maintenance of production	16·00	10·00
central workshop	8·00	2·70
drills for prospecting	2·00	1·40
advance action for the fourth Plan	10·00	7·00
central ropeways	16·00	8·00
additional washing capacity for coking coal	20·00	11·30
	149·00	74·40
oil		
oil exploration	115.00	53·53
iron ore		
Bailadila iron ore project	17·00	8·55
copper projects		
Khetri copper project	10·00	6·36 (Khetri and Daribo together)
Daribo copper project	2·50	
	12·50	6·36
total	293·50	142·84

*In addition some further amount may be needed for deep and gassy mines.

ANNEXURE I—*contd.*

	name of the scheme	location	total investment (Rs. crores)	foreign exchange component (Rs. crores)	capacity in 1965-66 (final capacity in the case of expansion)
57	Neiveli lignite high temperature carbonisation plant and connected facilities for pig iron production	Neiveli (Madras) . .	25·0	13·0	1 million tons of lignite
58	townships	at project sites . . .	50·0	..	
			466·4	205·9	
		total .	1260·69	634·5	

ANNEXURE II

1. Industrial projects of State Governments

name of the scheme	location	total investment (Rs. crores)	foreign exchange component (Rs. crores)	annual capacity in 1965-66 (final capacity in the case of expansion)
schemes with a total outlay of Rs. 50 lakhs or more				
A. projects spilling over from the Second Plan(a)				
1 expansion of Andhra Paper Mills . .	Rajamundry (Andhra Pradesh)	4·00	2·49	18,000 tons of paper
2 expansion of Mysore Iron and Steel Works	Bhadravati (Mysore)			
(a) steel expansion programme .		2·00*	3·50	100,000 tons of steel ingots
(b) expansion of the ferro-silicon plant .		0·95	0·37	20,000 tons of ferro-silicon
3 expansion of Government electric factory	Bangalore (Mysore) . .	0·90	0·48	electric transformers : 200,000 KVA electric motors : 60,000 h.p. switchgear and switchboards worth Rs. 40 lakhs
4 Durgapur coke ovens	Durgapur (West Bengal)			
(a) gas grid . .		2·25		7·5 million c.ft. of gas per day
(b) tar distillation plant		0·50	0·17	100 tons of tar per day
(c) doubling of coke ovens and by-products plant		4·20		coke : 650,000 tons benzene : 0·725 million gallons toluene : 0·235 million gallons napthalene : 1200 tons ; and road tar
B. new projects included in the Third Plan (b)				
5 natural gas distribution . . .	(Assam) . . .	1·65	0·30	
6 gas fractionation and transmission scheme	(Assam) . . .	1·50	0·50	
7 expansion of Bihar superphosphate factory	Sindri (Bihar) . . .	0·50	0·15	46,000 tons of superphosphate

*Made up of Rs. 5 crores in the Central Plan and Rs. 2 crores in the State plan.

ANNEXURE I—*contd.*

(Rs. crores)

name of the scheme	total outlay	foreign exchange component
C. other projects (b)		
coal		
non coking coal washeries	12·00	7·00
Neiveli lignite project		
expansion of mine output	3·80	1·45
oil		
oil distribution programme	10·00	..
Oil India	8·00	..
crude oil pipe lines	4·00	..
oil products pipe lines	37·00	10·00
	59·00	10·00
other minerals		
Sikkim copper project	2·50	1·30
Panna diamond project	1·50	0·60
manganese ore beneficiation plants	5·00	1·00
project for sulphur from pyrites	5·00	2·50
Kolar gold mines	1·50	0·84
Hutti gold mines	0·50	0·20
expansion of Kiriburu	6·00	3·00
uranium mining, fabrication and plutonium extraction plant	24·00	8·17
	46·00	17·61
surveys		
G.S.I. expansion	10·00	3·19
I.B.M. expansion	5·00	1·89
	15.00	5·08
grand total	466·51	193·21

3. assistance to institutional agencies and other miscellaneous requirements—Central

(Rs. crores)

name of the scheme	total outlay	foreign exchange component
assistance to Mysore Iron and Steel Works	5·0	..
N.I.D.C.	20·0	..
loans to institutional financing corporations	26·0	..
loan assistance to plantation industries	11·7	..
National Productivity Council	1·3	..
metric system	7·0	..
Indian Standards Institution	3·6	..
	74·6	..

ANNEXURE II—*contd.*

2. mineral projetcs of the State Governments

(Rs. crores)

name of the scheme	total outlay
new schemes included in the State plans with total outlay of Rs. 50 lakhs or more	
Kalakot coal mining project (Jammu and Kashmir) . .	0·60
Rajasthan mining corporation (exploitation of Palana lignite and flourspar at Dungarpur)	2·75
Board of Mineral Development of Mysore (exploitation of iron and manganese ores in the State)	0·90
miscellaneous schemes/programmes costing less than Rs. 50 lakhs each	6·75
	11·00

3. outlay requirements of States for participation in private industries and other programmes of assistance to private sector

(Rs. crores)

name of the scheme	location	total investment	remarks
industrial development areas	Andhra Pradesh, Assam, Bihar, Gujarat, Kerala Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Uttar Pradesh, West Bengal.	5 40	
State industrial development corporations	Andhra Pradesh, Bihar, Kerala, Madras, Uttar Pradesh.	6 08	
State participation in private sector projects	Assam, Jammu and Kashmir, Kerala, Mysore, Punjab, West Bengal.	9·47	
development of rubber plantation	Kerala	4 65	an area of 85000 acres
total		25·60	

(a) Figures of total cost and foreign exchange are the amounts expected to spill-over into the Third Plan.

(b) Figures of total cost and foreign exchange represent estimated outlays for the execution of the schemes. In the case of some of the listed projects, part of the expenditure would spill-over into the Fourth Plan having regard to the gap between the provision for industries and minerals and the outlay requirements.

ANNEXURE II—*contd.*

name of the scheme	location	total investment (Rs. crores)	foreign exchange component (Rs. crores)	annual capacity in 1965-66 (final capacity in the case of expansion)
8 expansion of high tension insulator factory	Ranchi (Bihar)	0·58	0·17	4,800 tons of insulators
9 fertiliser project*		20·00	10·00	80,000 tons of nitrogen
10 cotton spinning mill	Samba (Jammu and Kashmir)	0·50	0·25	12,000 spindles
11 pilot iron and steel plant	(Madras)	0·75		
12 steel rolling mill	(Madras)	1·00		20,000 tons of rolled products
13 distribution of gas in Bombay	(Bombay)	0·50		20 million c.ft. of gas per day
14 reorganisation of the workshop at Nangal	Nangal (Punjab)	0·50		
15 refractories plant	Churk (Uttar Pradesh)	0·85	0·30	24,000 tons of refractories
16 expansion of the precision instruments factory	Lucknow (Uttar Pradesh)	0·69	0·22	
17 organic chemicals scheme**	Durgapur (West Bengal)	4·00	2·00	caustic soda : 6,600 tons phenol : 6,600 tons chlorine : 5,800 tons Phthalic anyhydride : 6,600 tons formaldehyde : 5000 tons penta-chlorophenol : 1000 tons
18 cotton spinning mill	(West Bengal)	0·65	0·08	25,000 spindles
miscellaneous schemes costing less than Rs. 50 lakhs each		15·61	4·00	
grand total		64·08	24·98	

*Provisionally indicated in the state sector. Final decision about location and agency are yet to be taken.

**Private participation on a minority basis in the equity capital of the project is envisaged.

iv. paper machinery	Rs. crores	..	..	0·7	..	8·5	6·5 to 7·0	7·0	4·0
v. dairy machinery	,,	..	..	0·25	Neg.	2·5	2·5	0·5	..
vi. industrial boilers	,,	..	..	3·7	0·4	29·0	25·0 }	10·0(*d*)	5·0(*d*)
vii. cranes	000 tons	..	..	2·5	1·5	60	60 }		
viii. machine tools	Rs. crores	0·34	0·78	7·0	5·5	30·0	30·0	40·0	27·0
ix. heavy machinery building (steel and chemical machinery)	000 tons	..	..	..	..	80	(*c*) }	119.0	81·5
x. coal mining machinery	,,	..	..	..	..	45	30 }		
xi. heavy plate and vessel works (pressure vessels, heat exchangers & other types of chemical plants and equipment)	000 tons	..	..	..	..	40	30	20·0	12·0
10. structural fabrication (including heavy structural shop)	000 tons	..	90	500	150	1100	1000	25·0	10·0
11. precision instruments, industrial and scientific	Rs. crores	..	..	3·6	3·0	23	12	9·0	6·5
12. surgical instruments	million pieces	..	..	..	..	2·5	2·5	2·7	2·0
13. watches	000 nos.	..	..	..	..	360(f)	240(f)	4·0	2·5
14. railway rolling stock and components			..	..	..	..	..	2·0	1·0
i. locomotives:									
steam	nos.	7	179	300	295	300	1175(g)		
diesel	,,	..	..	..	..	n.a.	434(g)		
electric	,,	..	..	..	..	60	232(g)		
ii wagons (in terms of 4-wheelers)	,,	2924	41966(g)	26000	20000	33500	109866(g)		
iii. passenger coaches	,,	479	4384(g)	1300	1210	1420	7837(g)		
15. automobile and ancillary industries								85·0	40·0
i. passenger cars	000 nos. }	16·5	25·3	20	20	30	30		
ii. commercial vehicles	,, }			28	28	60	60		
iii. jeeps and station wagons	,, }			5·5	5·5	10	10		

ANNEXURE III

Expansion of selected major industries and minerals—progress and targets

name of industry	unit	1950-51 production	1955-56 production	1960-61 estimated capacity	1960-61 estimated production	1965-66 capacity	1965-66 production	fixed investment during 1961-66 (Rs. crores)	foreign exchange component of fixed investment (Rs. crores)
A. metallurgical industries									
1 iron and steel									
(i) steel ingots	million tons	1·4	1·7	6·0	3·5	10·2	9·2		
(ii) finished steel	,,	0·98	1·3	4·5	2·2	7·5	6·8		
(iii) pig iron for sale	,,	0·35	0·38	0·9	0·9	1·5	1·5	640·0	305·0
(iv) alloy, tool and special steel (finished)	000 tons	..	..	40	40	200	200		
(v) grey iron castings	million tons	..	..	n.a.	n.a.	1·2	1·2		
(vi) steel castings	,,	..	..	0·10	0·05	0·20	0·20	30·0(a)	15·0(a)
(vii) steel forging	000 tons	..	..	60	35	200	200		
2 ferro-manganese, electro-thermal	,,	nil	nil	150	100	220	200	2·5	2·0
3 ferro-silicon	,,	n.a.	n.a.	5	6	40	40	2·0	1·2
4 aluminium	,,	3·7	7·3	18·2	18·5	87·5	80·0	65·0	32·0
5 copper (fire refined and electrolytic)	,,	6·6	7·5	9·0	8·9	22·0	20·0	0·6(b)	0·4(b)
6 lead	,,	0·8	2·1	6·1	3·5	8·5	8·0	7·3	2·7
7 zinc	,,	..	..	nil	nil	15	15		
8 tungsten carbide	tons	..	..	5·0	4·0	69	25	1·0	0·5
B. mechanical engineering industries									
9 industrial machinery (1)									
i. cotton textile machinery	Rs. crores	n.a.	4·0	10·0	9·0	22·0	20·0	5·0	3·0
ii. cement machinery	,,	..	0·34(c)	1·1	0·6	4·5	4·5	3·0	2·0
iii. sugar machinery	,,	..	0·19	10·5	3·3	11·0 to 12·0	10·0		

C. electrical engineering industries									
24 electric transformers (below 33kv.)	million kva.	0·18	0·63	2·2	1·2	4·0	3·5		
25 electric motors (200 h.p. & below)	million h.p.	0·10	0·27	1·25	0·7	3·0(k)	2·5(k)		
26 electric cables & wires									
i. a.c.s.r.	000 tons	1·7	8·7	28	22	55	44		
ii. v.i.r. and plastic coated	million yds	39·4	86·9	500	220	800	600		
iii. paper insulated	miles	..	..	1000	750	4500	4000		
iv. dry core cables	miles	..	525	470(l)	1077	2000 to 2500	2000		
v. coaxial cables	miles	..	..	300	200	300	300	30·0	18·0
27 electric fans	million nos.	0·19	0·29	1·8	0·98	2·8	2·5		
28 house service meters.	,,	..	0·25(c)	0·6	0·46	2·5	2·1		
29 electric lamps									
(i) G.L.S. and others	million nos.	15·0	25·03	43·13(l)	38·05	76·0	68·0		
(ii) fluorescent tubes	million nos.	Nil	0·75	1·20(l)	1·46	7·0	6·0		
30 radio receivers (organised sector)	000 nos.	49·0	102·0	279·18(l)	254·0	900·0	800·0		
31 storage batteries	000 nos.	200·0	258·08	379·3(l)	509·0	900·0	800·0		
32 dry batteries	million nos.	136·3	161·1	224·50(l)	200·0	400·0	350·0		
33 heavy electrical equipment in the public sector	Rs. crores	..	..	..	..	80.0	80.0	104.0	60.0
D. chemical and allied industries									
34 fertilisers								225·0	100·0
i. Nitrogenous (in terms of nitrogen)	000 tons	9	79	248	110	1000	800		
ii. phosphatic (in terms of P_2O_5)	,,	9	12	60	55	500	400		
35. heavy chemicals								42·0	18·0
i. sulphuric acid	,,	99	164	476	363	1750	1500		
ii. soda ash	,,	45	81	268	145	530	450		
iii. caustic soda	,,	11	35	124	100	400	340		
iv. calcium carbide	,,	..	3(c)	17	10	67	60		
v. sodium hydro-sulphite	,,	..		2·3	0·6	12	10		
vi. hydrogen peroxide	,,	..	..	3	1·2	9·5	8		

ANNEXURE III—*contd.*

name of industry	unit	1950-51 production	1955-56 production	1960-61 estimated capacity	1960-61 estimated production	1965-66 capacity	1965-66 production	fixed investment during 1961-66 (Rs. crores)	foreign exchange component of fixed investment (Rs. crores)
iv. automobile ancillaries including									
trailers	000 nos.	..	..	0·7	n.a.	2·5	2·5		
v. motor cycles and scooters	,,	..	1·5	24	18	48 to 60	50		
16 ball and roller bearings	million nos.	0·08	0·9	1·6	2·9	10·0	14·0(h)		
17 earth moving equipment									
i. crawler tractors	nos.	..	..	..	..	600	500		
ii. dumpers and scrapers	,,	..	..	..	..	600	500		
iii. shovels.	,,	..	..	..	..	125	100		
18 road rollers	,,	..	..	800	400	800	700		
19 agricultural implements and machinery								27·0	18·0
i. power driven pumps	000 nos.	34	37	184	90	184	150		
ii. diesel engines (stationery)	,,	5·5	10	62	40	72	66		
iii. tractors	,,	..	..	1·05	0·6	12·0	10·0		
20 bicycles	million nos.	0·10	0·51	2·2	1·05	2·2	2·0(i)		
21 sewing machines	000 nos.	33	111	268	297	700	700(j)		
22 welding electrodes	million r. feet	..	..	600	350	1080	900		
23 ship building (expansion of Hindustan shipyard, dry dock and second ship-yard)	000 GRT	..	50(g)	20	20	50 to 60	50 to 60	32·0	7·0

40 plastics (polyethylene, p. v. c., polystyrene and others)	000 tons	..	0·7	15·7	10·0	85·0	74·0	27·5	10·5
41 i. soap (2)	000 tons	106	102	254	150	254	500		
ii. synthetic detergents	000 tons	..	..	7·2	1·5	20·0	20·0		
42 raw films : cinematographic etc.	million sq. metres	..	..	..	..	10·0	10·0	9·0	5·5
43 rubber manufactures									
i. automobile tyres	million nos.	..	0·9	1·61	1·35	3·7	3·0	11·5	5·0
ii. bicycle tyres	million nos.	..	5·8	16·9	11·0	38·6	31·0		
44 synthetic rubber	000 tons	..	..	..	..	50	50	25·0	12·5
45 i. paper and paper board	000 tons	114	187	410	350	820	700 }	100·0	35·0
ii. newsprint	000 tons	..	4·2	30	25	150	120 }		
iii. security paper	tons	..	..	..	..	1500	1500	5·5	4·0
46 cement	million tons	2·7	4·6	9·0	8·5	15·0	13·0	60·0	12·0
47 refractories	million tons	..	0·28	0·87	0·52	2·0	1·6	22·0	10·0
48 electric porcelain (h. t. & l. t. insulators)	000 tons	..	4·3	12·5	8·4	30	24	3·0	2·2
49 glass & glassware (including opthalmic glass)	000 tons	92·0	125	370	225	615	440	11·0	3·5
50 i petroleum products	million tons	..	3·6	6·02 (crude oil)	5·67	10·77 (crude oil)	9·86	} 73·5	33·4
ii lubricating oils	000 tons	..	..	..	..	100	100	}	
51 power and industrial alcohol	million gallons	8·6	15·2	40	22	72	60	4·0	0·4
52 industrial gases								11·0	6·5
i. oxygen	million cft.	..	..	1000	700	2300	1650		
ii. acetylene	million cft.	..	..	156	90	250	200		
E. textile industries									
53 cotton								32·5	11·0
i. yarn	million lb	1179	1640	2100	1750	2250	2250		
ii. cloth (mill made)	million yds	3720	5102	5300	5127	5800	5800		
jute	000 tons	892	1150	1200	1065	1200	1100		

ANNEXURE III—*contd.*

name of industry	unit	1950-51 production	1955-56 production	1960-61 estimated capacity	1960-61 estimated production	1965-66 capacity	1965-66 production	fixed investment during 1961-66 (Rs. crores)	foreign exchange component of fixed investment (Rs. crores)
36 miscellaneous chemicals products								13·0	5·0
i. carbon black	,,	..	..	..	..	30	30		
ii. industrial explosives :									
(a) blasting explosives	,,	..	..	5	6	20	20		
(b) liquid oxygen explosives	,,	..	..	2	2	9	9		
(c) safety fuses	million coils.	..	..	7	2	25·0	25·0		
(d) detonators.	million nos.	..	..	..	..	80	80		
iii. rubber chemicals	000 tons	..	..	2	n.a.	3	3		
37 coke									
i. soft coke (low temperature carbonisation)	million tons	..	..	..	..	2·0	1·8	42·0	26·6
ii. hard coke by-product	000 tons	..	..	620	500	1160	1100	29·2	13·0
38 dyestuffs & organic intermediates								28·0	13·0
i. dyestuffs	million lb	..	4·0	18	11·5	22·4	18·0		
ii. intermediates	tons	..	..	..	..	25000	25000		
39 drug and pharmaceuticals								39·3	18·0
i. sulpha drugs	tons	..	83(c)]	330	150	1000	1000		
ii. penicillin	million mega units	..	6·6	45	40	205	120		
iii. streptomycin	tons	..	..	..	..	150	150		
iv. p.a.s.	,,	..	40(c)	145	100	400	400		
v. anti-dysentery drugs	,,	..	6·0(c)	60	30	75	75		
vi. i.n.h.	,,	..	1·0(c)	33	30	100	100		
vii. phytochemicals	,,	..	..	..	..	76·4	76·4		
viii. d.d.t.	,,	..	284	2800	2800	2800	2800		

61 miscellaneous industries	168·0(n)	43·0
total	2454·6	1109·9

N.B. Capacity for engineering industries is estimated on the basis of double shift operation.

(1) Except in the case of cotton textile machinery, capacity and production under this head are related to the demands for original equipment.

(2) Excepting for the production figure in 1965-66, the figures relate to the organised sector only.

(3) Figures relate to crop year.

(a) Over and above the expenditure envisaged under Foundry/Forge (included under item 9 (ix) in the table), Mining Machinery Project and steel castings foundry of Chittaranjan Locomotive Works.

(b) Investment on the cpacity under the public sector is shown under the outlay on Minerals.

(c) Relates to calendar year.

(d) Expenditure envisaged on private sector schemes only. Expenditure envisaged in the public sector are included under items (10) and (33) in the table.

(e) Actual production will be linked by and large with the programme for expansion of steel capacity.

(f) Relates to the public sector only.

(g) Relates to five year period.

(h) By working the capacity on three shifts.

(i) An additional 0·5 million bicycles are expected to be produced in the small-scale sector.

(j) An additional 150000 sewing machines are expected to be produced in the small-scale sector.

(k) These figures are for 300 h.p. and below.

(l) Single shift capacity.

(m) Figures relate to organised sector only.

(n) Including Rs. 50 crores for townships and Rs. 47·0 crores for other public sector projects not covered under above industries.

ANNEXURE III—*contd.*

	name of industry	unit	1950-51 production	1955-56 production	1960-61 estimated capacity	1960-61 estimated production	1965-66 capacity	1965-66 production	fixed investment during 1961-66 (Rs. crores)	foreign exchange component of fixed investment (Rs. crores)
54	rayon and staple fibre								75·0	45·0
	i. rayon filament	million lb	0·4	16·0	52·3	47·0	140·0	140·0		
	ii. staple fibre	million lb	..	14·0	48·0	47·8	75·0	75·0		
	iii. chemical pulp	000 tons	..	..	..	..	100·0	90·0		
56	woollen manufactures								2·0	1·0
	i. woollen and worsted yarn	million lb	18·3	21·7	67	28	67	52		
	ii. woollen cloth	million yds	..	15·0	48	15	48	35		
	iii. wool tops	million lb	.	..	10	..	31·5	31·5		
	F. food industries									
57	salt	million tons	2·7	3·0	3·9	3·7	6·5	5·4	9·0	2·0
58	sugar (3)	million tons	1·12	1·86	2·25	3·0	3·5	3·5	100·0	12·0
59	vegetable oils									
	i. solvent extraction of oilcakes	000 tons	..	..	550 (cake)	25 (oil)	2000 (cake)	160 (oil)	10·0 (for items 59 i, ii and 60)	2·5 (for items 59 i, ii and 60)
	ii. cotton seed oil	000 tons	..	..	180(m) (seed)	15(m) (oil)	850 (seed)	100 (oil)		
60	vanaspati	000 tons	153	276	434	330	550	500		

4. While the expansion of production from existing workings in both the public and private sectors did not present any serious difficulty, the establishment of additional production from new collieries made the task of the public sector a formidable one. New mines had to be established in practically virgin areas. Legislation had to be passed to enable the public sector to acquire new areas; and these had to be prospected in detail in order to prove the reserves and to select the blocks to be developed. In addition the public sector had to build up an organisation practically from nothing and there was a serious shortage of experienced technical personnel fitted to hold supervisory posts. This combined with initial difficulties in securing foreign exchange for the programme, resulted in rather slow progress during the early years of the Plan. The production achieved during the Second Plan has, therefore, to be viewed in the context of these difficulties. As against a target of 60 million tons, production during 1960-61 has been 54·62 million tons. Though the actual production has fallen short of the target, the public sector, which includes the collieries of the National Coal Development Corporation and the Singareni collieries, has established capacity for achieving a rate of production commensurate with the target set for it. In the last year production from the mines of the National Coal Development Corporation has increased rapidly. It rose from a level equivalent to an annual rate of 5·3 million tons in the first quarter to the equivalent of an annual rate of 13·7 million tons in the last quarter as compared with a production target for the whole year of 13·5 million tons. The corresponding figures for the Singareni collieries are 2·4 million tons and 2·6 million tons against a production target of 3 million tons and for the private sector 43·8 million tons and 45·7 million tons against a target of 44 million tons.

5. The progress of coal production during the last ten years and the actual fieldwise production during 1960-61, as compared with what was visualised at the beginning of the Second Plan are shown in the following Tables:

Table 1: Coal production

year	(million tons)
1951	34·43
1952	36·30
1953	35·98
1954	36·88
1955	38·23
1956-57	40·30
1957-58	44·10
1958-59	45·94
1959-60	47·82
1960-61	54·62

CHAPTER XXVII

MINERALS AND OIL

REVIEW OF PROGRESS DURING THE FIRST AND SECOND PLAN PERIODS

In the field of industry the First Plan was primarily one of preparation for large-scale development. It did not, therefore, call for any considerable increase in mineral production, but rather focussed attention on the systematic and detailed investigation of the country's resources of important minerals with a view to assessing more accurately both their quantity and quality, and on the adoption of measures to ensure that they would not be recklessly squandered. Although the country had already been surveyed geologically in a general way and the principal mineral regions ascertained, the exploration of mineral resources had, in most cases, not been thorough or complete and estimates of reserves were very rough approximations. The establishment of the Indian Bureau of Mines in 1948 and the expansion of the Geological Survey of India, agreed to in January, 1951, paved the way for fuller and more systematic investigations and greater attention to measures of conservation. These began to bear fruit during the Second Plan and in the past few years the output of certain minerals, *e.g.*, coal, iron ore and bauxite has increased substantially.

2. The progress made in different fields during the last ten years is briefly reviewed in the following paragraphs.

COAL

3. *Production.*—The First Five-Year Plan did not contain any specific programme for coal production—the order of increase in demand was such as could be met by the capacity already established. On the basis of the coal requirements of the industrial and power programmes envisaged in the Second Plan and the traffic expected to be carried by the railways, a production target of 60 million tons was set for coal in the last year of the Second Plan. This meant an increase of 22 million tons over the level of production reached in 1955. The order of increase was such as could not be met merely by expansion of production from existing collieries; it required also the opening of new mines. Having regard to the capacity of the existing collieries to increase production and also to the policy of the Government, which reserved the establishment of new units to the public sector, 12 million tons of additional production were allocated to the public sector—2 million tons from existing collieries and 10 million tons from new collieries to be established in virgin areas—leaving the balance of 10 million tons to be raised by the private sector from their existing collieries and areas immediately contiguous thereto.

been set up. The other three will be completed only during the early years of the Third Plan. The experience in the Second Plan has been that the preliminaries to the setting up of washeries take a great deal of time. The washability characteristics of coal from different seams and from different collieries have to be studied in order (a) to determine the method of washing and to draw up specifications for the washeries and (b) to select the collieries which should supply each one of the washeries.

(iv) *Blending.*—The blending of weakly coking or non-coking coal with strongly coking coal will serve to extend the life of the limited reserves of coking coal. The Durgapur steel plant is based on the use of weakly coking or semi-coking coal from the Raniganj coalfield up to 55 per cent blended with coking coal from Jharia.

(v) *Substitution of coking coal by non-coking coal.*—A phased programme for the substitution of coking coal by non-coking coal on the railways was worked out. However, since the demand for coking coal from essential consumers did not materialise as visualised earlier, the railways continued to use coking coal to the extent that production was surplus to the requirements of essential consumers. The quantum of such surplus, however, decreased from about 5 million tons in 1957 to about 1·5 million tons in 1960.

(vi) *Other measures.*—Collieries which in the national interest are required to continue in production but which are handicapped by various adverse factors such as gasiness, depth of the workings, etc. are given a special subsidy.

7. *Amalgamation of collieries.*—Government have accepted in principle the amalgamation of small and uneconomic collieries as recommended by the Committee on Amalgamation of Small Collieries. Pending the passing of legislation for compulsory amalgamation, a Committee to encourage voluntary amalgamation was set up. This Committee has so far approved 31 cases of voluntary amalgamation out of which upto the end of March, 1961, actual amalgamation has taken place in 17. The Committee is still continuing its work. In order that there may be no danger of slowing down the programme for increasing coal production, the introduction of legislation for compulsory amalgamation has been postponed till about the middle of the Third Plan period.

Mineral Oil

8. There is at present no production of oil within the country except for a small quantity obtained from the Digboi area in Assam. It is, however, expected that an annual production of 2·75 million tons of crude oil will soon be obtained from the Nahorkatiya oil field discovered by the Assam Oil Company. The Government of India's share in Oil India, the Company which has been formed to exploit these oil resources,

Table 2: Fieldwise production in 1960-61

(million tons)

fields	as envisaged in the Second Plan	actual production in 1960-61
Assam	0·50	0·68
Darjeeling	0·03	0·04
Raniganj	18·16	18·08
Jharia	16·69	16·09
Karanpura	6·00	4·48
Bokaro	2·88	3·75
Giridih	0·26	0·46
other small fields in Bihar	0·14	0·15
Chhindwara and Chanda	2·25	3·06
Korba	4·00	0·57
central India coal-fields	5·31	3·67
Sasti	0·07	0·14
Orissa	0·52	0·88
Singareni	2·93	2·52
Bikaner	0·03	0·05
total	59·77	54·62

It will be seen that the actual production in 1960-61 differs from that originally envisaged specially in the Korba and Central India Coalfields. This was because certain adjustments became necessary as a more clear picture of the factors relevant to the production and distribution of coal emerged. Moreover, the quality of coal from Central India Coalfields was not according to expectations.

6. *Conservation.*—The following measures have been taken for conserving the limited reserves of coking coal:

(i) *Stowing.*—With the passing of the Coal Mines (Conservation and Safety) Act, 1952, stowing which was till then compulsory from the point of view of safety was extended to cover conservation.

(ii) *Restriction of output.*—Ceiling limits were fixed for the production of coking coal, the idea being to reduce output of coking coal to the level of the demand of essential consumers. However, during the Second Plan, owing to the need to increase production to meet the demands of the steel expansion programme, the limits were gradually raised again and now, with the commissioning of the new steel plants and the expansion of the existing ones, the reasons for pegging production have ceased to exist.

(iii) *Establishment of washeries.*—Washing being one of the measures of conservation, the Second Five-Year Plan provided for additional washing capacity of 6·4 million tons to be achieved by the establishment of four central washeries and the installation of a washing unit as an adjunct to the Durgapur steel plant. The unit in the Durgapur steel plant (capacity 0·8 million tons) and the washery at Kargali (1·6 million tons) have

increased from about Rs. 83 crores in 1950 to about Rs. 159 crores in 1960. The most striking increase is in the case of iron ore which rose from about 2·97 million tons in 1950 to about 10·5 million tons in 1960. This rapid increase is due to the expansion of steel production in the country and the development of export to Japan and other countries. There was not, however, the same steadily rising trend in the production of manganese ore, which is mined mainly for export. Production of manganese ore increased from 0·88 million tons in 1950 to 1·9 million tons in 1953—the spurt in production being largely due to the stockpiling programme of the U.S.A.—but subsequently it has been fluctuating with a general tendency to decline. This is due partly to the curtailment of the stockpiling programme and the recession in the steel industry in U.S.A. during 1958 and partly to the emergence of competitors in the markets for manganese ore.

12. The trends in the volume and value of production of some important minerals are shown below:

Table 3: Trends in volume and value of mineral production

value in lakhs of rupees
volume 000 tons

mineral	1950		1955		1960*	
	volume	value	volume	value	volume	value
coal	32310	4668	38230	5603	51810@	10895
iron ore	2970	154	4680	323	10520	770
manganese ore	880	848	1580	1082	1160	818
limestone	2920+	103+	7370	302	12530	562
chromite	17	6	89	27	99	57
ilmenite	213	33	251	132	246	147
bauxite	64	8	90	9	377	42
magnesite	53	11	58	13	154	27
gypsum	206	14	690	45	982	63
copper ore	360	120	353	258	441	237
lead concentrates	2+	N.A.	3	8	6	22
zinc concentrates	2+	7+	5	17	10	25
total value of all minerals including the above		8341		9436		15902

* Provisional figures

@ Includes lignite from Jammu and Kashmir—4647 tons in 1960.

+ Figures relate to calender year 1951.

N.A.—Not available

has recently been raised from one-third to one-half. The crude oil is to be piped to two new refineries which are being built in the public sector at Gauhati (Nunmati) in Assam and Barauni in Bihar with a capacity of 0·75 million tons and 2 million tons respectively. Besides oil, the Nahorkatiya area also contains natural gas. The total quantity likely to be available is not yet known, but arrangements have already been made to utilise some of it for the generation of power, the production of fertilisers and other purposes.

9. The Indo-Stanvac Petroleum Project marked the first major effort at exploring for oil outside the known oil bearing regions of Assam. The Government of India contributed one-fourth of the expenditure incurred on the Standard Vacuum Oil Company's exploration in the West Bengal basin. Several exploratory wells were drilled, but since no oil or gas was located, the company abandoned the project. Government's share of the expenditure was Rs. 1·67 crores.

10. In view of the great need to establish indigenous sources of oil, the nucleus of an organisation for oil exploration was set up by Government towards the end of the First Plan period. With the limited equipment and technical personnel available, investigations were started in the Jaisalmer area of Rajasthan. The Second Plan provided for an intensification of the effort and enlargement of the organisation therefor. The Oil and Natural Gas Commission was set up, first as a departmental organisation but converted later into a statutory body. The Commission undertook geological surveys, geo-physical investigations and exploratory drilling for oil in Punjab and later in the region of Cambay and in the Brahmaputra valley in Assam. In Punjab no oil or commercially exploitable gas has been discovered in the areas investigated so far;. investigations are being continued in other areas of this State. The exploration in Cambay was more successful in that oil was struck in the very first well. Encouraged by this initial success, a number of wells have been drilled in Cambay and later in the Ankleshwar area. Oil and/or gas has been met with in many of the wells and though more will have to be drilled before the potentialities of this discovery can be firmly assessed, the indications are that there is a sizeable oilfield in this area. Two wells have been drilled in the Brahmaputra valley in Assam outside the area held under lease by Oil India and one of them has given indications of oil. Geological and geophysical investigations were also extended to the Ganga valley.

The expenditure incurred on oil exploration by Government in the Second Plan has been about Rs. 26 crores.

Mineral Production

11. During the ten years 1951-60 there has been a general increase in the volume and value of mineral production. The value of production

14. The Table below gives a broad indication of the more important results of the investigations carried out during the last ten years:

Table 4: Estimate of reserves

(million tons)

mineral		as at the beginning of the First Plan	as revised now	remarks
coal		37300	50000	in addition there are inferred reserves of 80,000 million tons
manganese ore		20 (high grade)	180	about 40% being of marketable grade
copper ore	Khetri	no estimate	28	with an average copper content of 0·8 per cent
	Sikkim	no estimate	0·35	with an average combined copper lead and zinc content of 6·24 per cent
pyrites	Amjor	no estimate	384	of which 8 million tons represents proved reserves and 68 million tons probable reserves. Average sulphur content of the proved reserves is 40 per cent
	Ingaldal	no estimate	2·0	
gypsum	Nagaur (Rajasthan).	no estimate	1000	
	Ramban (Jammu and Kashmir)	no estimate	50	
limestone	Shahabad district	no estimate	about 44 million tons of flux grade and 268 million tons of furnace grade	
chromite	Byrapur (Mysore)	no estimate	0·7	
iron ore	Kiriburu (Orissa)	no estimate	173	
bauxite	Jamnagar District (Gujarat)	no estimate	6	
magnesite	Almora (Uttar Pradesh)	no estimate	12	
apatite	Singhbhum copper belt (Bihar)	0·7	1·8	
lead and zinc	Zawar (Rajasthan)	no estimate	10·7	with an average combined lead and zinc content of 3 per cent
bentonite	Barmer (Rajasthan)	no estimate	10·0	

Mineral Surveys

13. With the expansion during the first two Plan periods of the Geological Survey of India and the Indian Bureau of Mines, geological mapping on the scale of one inch to a mile was extended to cover new areas and some important mineralised areas were mapped on larger scale maps. At the beginning of the Second Plan period about 24 per cent of the area of the country had been surveyed and mapped on the scale of one inch to a mile. During the Second Plan period, map coverage on this scale was extended to an additional 40,000 square miles and 5775 square miles of mineralised areas were mapped on larger scale maps. Detailed prospecting in parts of the Karanpura, Bokaro, Korba, Korea, Bisrampur, Jhilimili, Kalakot, Talcher and Dharangiri coalfields blocked out sufficient reserves of coal for establishing new mines in some of these fields during the Second Plan period. These investigations led to the discovery of a 70 to 90 feet thick seam in the Singrauli coalfield and of two seams, one 74 feet and the other 12 feet and 8 inches thick in the Ramgarh coalfield, the latter being of coking quality. Besides, the existence of the Dishergarh seam at an easily minable depth, the caking Laikdih seam 20 feet thick in an unleased area in the Raniganj coalfield, the caking Barakar seam under the Barren Measures in the Jharia coalfield and the eastward extension under alluvium of the coal Measures of the Raniganj coalfield have also been established. Proving of iron ores in the Rajhara and Barsua areas helped in the establishment of new mines for the supply of iron ore to the Bhilai and Rourkela steel plants and the reserves proved in the Kiriburu area formed the basis of the Kiriburu iron ore project, which is to supply 2 million tons of iron ore annually for export to Japan. Detailed structural mapping of the manganese ore deposits in Madhya Pradesh and Maharashtra has indicated that the reserves are much larger than estimated hitherto. Surveys were carried out with a view to assessing the potentialities of the known and reported occurrences of non-ferrous metals, particularly copper, lead and zinc. Drilling and exploratory mining work done at Khetri (Rajasthan) and in Sikkim have proved the existence of about 28 million tons of copper ore (average copper content 0·8 per cent) in the Khetri area and about 0·35 million tons of ore containing on an average 6·24 per cent of copper, lead and zinc in Sikkim. The availability of substantial quantities of gypsum in Nagaur (Rajasthan), magnesite in the Almora district (Uttar Pradesh), pyrites in Amjor (Bihar) and limestone in the Shahabad district (Bihar) has also been indicated.

18. The target of 97 million tons set for the Third Plan will require production to be stepped up by 37 million tons over the Second Plan target of 60 million tons. Though the latter has not been fully achieved, the necessary investments have been made for creating capacity commensurate with the target during the Second Plan period itself. Production during March, 1961, amounting to 5·27 million tons, was a little over the monthly rate required to achieve an annual output corresponding to the production target set for 1960-61.

19. During the Second Plan the contribution of the private sector towards additional production came from existing mines, whereas the *major portion of the additional production in the public sector* was from new areas. The increase required during the Third Plan is of such a magnitude that it will necessitate the opening of a large number of new mines, particularly in the public sector, both in areas which are already developed and in entirely virgin areas. This will call for a great deal of effort and of capital investment.

20. The steel plants and merchant cokeries are estimated to require 25 million tons and 2 million tons respectively of metallurgical coal. Conservation of the limited reserves of coking coal require the use, to the extent possible, of blends of weakly coking or semi-coking coals with strongly coking coal thereby reducing the consumption of coking coal. A start in this direction has already been made. The Durgapur steel plant and the West Bengal Government's coke oven plant at Durgapur both use blends of semi-coking coal from Raniganj and coking coal from Jharia. Actual production of coking coal of superior grades (selected grades and grade-I) during 1960 was about 13 million tons and that of blendable coal about 2 million tons. On the basis that a part of the requirements of metallurgical coal industries will be met by blendable coal, the net additional output of coking coal and blendable coal required by the end of the Third Plan period are estimated at about 10 million tons and 2 million tons respectively. The net additional output of superior grades of non-coking coal required for the railways and other industries is estimated at about 10 million tons. The gradewise break-up of the production target of 97 million tons is given below:

	(million tons)
selected-A	12·05
selected-B	18·87
grade-I	44·28
grade-II	15·97
grade-III	5·71
total	96·88

The most important objective of the coal programme during the Third Plan is to ensure that the necessary quantities of coking and blendable coals are made available to the steel plants and merchant cokeries

PROGRAMMES FOR THE THIRD FIVE YEAR PLAN

15. The greater emphasis laid on the expansion of industry during the Third Plan calls for an intensified programme of mineral exploration and development. The main objectives will be exploration of the country's mineral resources with a view to—

(a) locating workable reserves of minerals and metals, the requirements of which are being met today either wholly or partly by imports;

(b) proving additional reserves of minerals like iron ore, bauxite, gypsum, coal, limestone, etc., which can be developed to meet the expanding requirements of the economy; and

(c) proving reserves and establishing new mines for the production of minerals like iron ore which can be exported.

These objectives require an intensification in the coming years of geological mapping, a wider adoption of geo-physical and geo-chemical methods, and detailed prospecting of promising mineral occurrences so as to assess their extent and quality with a view to developing them.

16. The programmes of mineral development envisaged in the Third Plan, set out in the Annexures to Chapter XXVI on Industries, entail an outlay in the public sector of the order of Rs. 478 crores (including a foreign exchange element of Rs. 200 crores) and in the private sector of about Rs. 60 crores (with a foreign exchange component of Rs. 28 crores). The current allocations for industries and minerals in the public sector amount to Rs. 1520 crores as compared with total requirements of Rs. 1882 crores. This gap between the requirements and the actual availability of resources suggests that there will be a sizeable spill over into the Fourth Plan, and that some of the physical targets will not be fully achieved by the end of the Third Plan period. As explained in the Chapter on Industries (paragraph 24), it is difficult at this stage to indicate with any degree of accuracy which projects will get delayed.

COAL

17. *Assessment of demand.*—Having regard to the programmes for thermal power generation and railway development and the targets set for iron and steel, cement and other industries which are important consumers of coal, the demand for coal in the last year of the Third Plan is estimated at 97 million tons. In arriving at this estimate, allowance was made for (a) the effects of the programmes of electrification and dieselisation on the railways' requirements of coal, and (b) the use of washery middlings and lignite for thermal power generation.

area	(million tons)
Pench-Kanhan	1·0
Charcha-Jhilimili	1·0
West Bokaro	0·5
Ramgarh	1·5
Korba (Ghordewa seam)	1·5
Raniganj (Block numbers VIII & IX)	0·5
Raniganj (other blocks)	0·5
Dishergarh	0·5
Jharia	1·5
total	18·5

Of the above projects, the first two are firm—project reports have been prepared and approved and production will commence during the first year of the Third Plan. The next four projects are in the nature of extensions of existing mines and since the basic data regarding reserves are already available there should be no great difficulty in achieving the targets indicated against them. In regard to the other projects prospecting has not been completed in all areas; it is, however, expected that sufficient data to enable project reports to be prepared will have been collected during the first two years of the Third Plan and that new mines can be established during the third year of the Plan period. These programmes should make possible the raising of a total of 18·5 million tons as compared with 17 million tons which the National Coal Development Corporation is expected to contribute. A higher capacity has been visualised with a view to covering possible shortfalls in the actual implementation of these programmes. The programme of the National Coal Development Corporation will call for the almost simultaneous establishment of several new mines in virgin areas. This will be quite a big task for a country which is at the same time developing its other industries on a wide front. In view of the magnitude of the task and the shortage of experienced technical personnel, the programme envisages securing technical collaboration from U.K., Poland, West Germany, France, U.S.S.R. and the U.S.A. in the establishment of new mines, workshops and washeries.

23. The capital investment required for establishing an additional production of 20 million tons in the public sector is estimated at about Rs. 103 crores. In addition, the preliminary work for the coal programme in the Fourth Five Year Plan is estimated to cost a further Rs. 10 crores during the Third Plan period.

PRIVATE SECTOR PROGRAMME

24. The break up of the additional production from the private sector as assessed by the Working Group is:

coking coal—4·87 million tons;
blendable coal—1·12 million tons; and
superior grades of non-coking coal—10·84 million tons.

and of superior grades of non-coking coal to the railways and other industries which necessarily require them. The additional raisings of these classes of coal will have to come mainly from the Jharia and Raniganj coalfields, with the public sector taking a more active part than hitherto.

21. *Allocation of additional production.*—In drawing up the programme and more particularly in deciding how much of the additional production should come from the private sector and how much from the public sector, the above mentioned objective and the following factors have been kept in view, viz.:

(a) the capacity of the private sector to expand production from their existing mines and areas nearby; and

(b) Government's policy which reserves to the public sector the establishment of new mines.

The capacity of the private sector to increase their output was assessed by a Working Group which, after examining the details of the expansion programme put forward by individual companies, assessed their capacity at 16·83 million tons. On this basis, the share of the public sector in the additional production of 37 million tons will be 20 million tons. The allocations of the additional production to the two sectors are not to be considered as rigid. The progress of the programmes will be kept under constant review so that adjustments can, if necessary, be made, the basic objective being to ensure that the total production planned is actually achieved.

PUBLIC SECTOR PROGRAMME

22. Three million tons of the additional production in the public sector are to be obtained by the expansion of the Singareni collieries in Andhra Pradesh. This is to be achieved by the expansion of existing workings and by sinking new shafts mostly in new areas. The balance of 17 million tons has to be raised by the National Coal Development Corporation. Prospecting of new areas with a view to increasing output in the Third Plan was started in 1958 and on the basis of the material collected so far the Corporation has formulated a programme for the production of an additional 18·5 million tons, the tentative fieldwise distribution of which is as follows:

Table 5: Fieldwise distribution of additional production of N.C.D.C.

area	(million tons)
South Balanda	1·0
Bisrampur	2·5
North Balanda	1·0
Jarangdih	0·2
Kathara (additional)	0·5
Kargali-Bokaro (additional)	0·5
Sawang	0·3
Singrauli	2·5
Kamptee	1·5

26. Viewed in the perspective of the future requirements of coking coal for steel production, the reserves of coking coal as known today are rather limited—they are only of the order of 2800 million tons—while there are very large reserves of high grade iron ore. This situation calls for the adoption of measures which will, on the one hand, conserve the limited supplies of coking coal—measures such as stowing, washing and blending which will have the effect of extending the life of the reserves—and on the other, economise its consumption. The use of sintered ore in blast furnaces besides making use of iron ore fines, which would otherwise go waste, also tends to reduce the consumption of coal per ton of steel produced. While other measures of conservation are already being adopted, there would appear to be need for more widespread use of sintered ore than at present. The technical feasibility of agglomeration to render iron ore fines suitable for use in steel plants or for export, the economics thereof and the extent to which this method can be adopted in practice are being examined by a committee appointed by the Government.

27. The trend in gradewise production of coal during the last few years discloses a tendency for an increasing proportion of total production to consist of grade—I and inferior grades of coal. The Table below relating to the West Bengal and Bihar coalfields brings this out very clearly.

Table 7:. Trends in gradewise production of coal from West Bengal-Bihar coalfields

(million tons)

year	selected-A	selected-B	grade-I	grade-II	grade-III	total
1951 . .	7.203	9.404	5.080	4.501	2.028	28.216
1955 . .	7.168	10.276	6.309	5.415	1.570	30.738
1956 . .	6.826	10.396	6.988	5.296	1.842	§ 31.348
1960 . .	7.457	9.900	14.336	5.958	3.210	40.861

The total production increased from 28·2 million tons in 1951 to 40·86 million tons in 1960 but production of selected 'A' increased only from 7·2 to 7·5 million tons and selected 'B' from 9·4 to 9·9 million tons (even though during 1955 and 1956 it rose to 10·3 million and 10·4 million tons respectively). The production of grade—I rose from 5·1 million tons to 14·3 million tons, grade—II from 4·5 to 6 million tons and grade—III from 2·0 to 3·2 million tons. This tendency is attributable partly to the gradual exhaustion of the more easily workable reserves of selected grades of coal and the discontinuance of selective mining and partly to the increasing mechanisation of mining operations. By the end of the Third Plan period, the proportion of Grade—I and inferior grades of coal to total production will increase much more rapidly than that of selected grades. In view of the increasing difficulty in stepping up the output of the better grades of coal, there is an urgent need for economy in their

The coking coal will come mainly from Jharia, the blendable coal from Raniganj and the non-coking coal mainly from the Raniganj field with smaller quantities from the Bokaro, Karanpura and Madhya Pradesh fields. Besides estimating the additional production possible in terms of coking, blendable and non-coking coal, the Working Group gave the distribution of the additional production gradewise and fieldwise and indicated a year-wise phasing of production. The major portion (11 million tons) of this additional production will be from existing mines and the balance from new sinkings in existing leasehold areas. The private sector's programme is estimated to involve a capital outlay of the order of Rs. 60 crores with a foreign exchange component of Rs. 28 crores.

25. From the gradewise break-up of the target of 97 million tons indicated in paragraph 20 above, it will be seen that the proportion of inferior grades is very small. The demand for inferior grades which are used, among other things, for brick burning and domestic purposes cannot be forecast with as much precision as that for the better grades which are required by the major consumers. Production of the inferior grades can, however, be stepped up comparatively cheaply and quickly as they are largely obtained from open quarries and in their case it is transport rather than the ability to increase raisings which is likely to be the limiting factor. The fieldwise distribution of the additional production of both private and public sectors programmed together is given in the Table below:

Table 6: Fieldwise distribution of additional production of coal (public and private sectors)

(million tons)

fields	coking	blendable	non-coking	total
Bengal-Bihar :				
Raniganj	0·35	1·62	8·66	10·63
Jharia	5·84	..	..	5·84
Bokaro	1·68	..	0·33	2·01
West Bokaro	0·50	..	..	0·50
Ramgarh	1·50	..	..	1·50
Karanpura	..	..	0·42	0·42
Madhya Pradesh :				
Pench-Kanhan	..	..	3·43	3·43
Bisrampur	..	..	2·50	2·50
Charcha-Jhilimili	..	0·50	0·50	1·00
Singrauli	..	..	2·50	2·50
Korba	..	..	1·50	1·50
Maharashtra : Kamptee	..	..	1·50	1·50
Orissa : Talcher	..	..	2·00	2·00
Andhra Pradesh : Singareni	..	..	3·00	3·00
total	9·87	2·12	26·34	38·33

and mine surveying has been approved. Proposals are also under consideration for the starting of evening mining classes in the States of West Bengal, Madhya Pradesh, Bihar and Orissa—West Bengal and Bihar already have evening mining classes, but they need to be reorganised with a view to bringing them to the level of the National Certificate Course.

32. The National Coal Development Corporation is running five training schools. These schools, the capacity of which has recently been practically doubled, will be sufficient to meet the requirements of the Corporation for at least the first three years of the Plan period. The Singareni collieries have introduced an apprentice scheme for various trades. In the private sector of the industry, a few of the bigger groups of collieries have regular schools of their own where apprentices are taken and given training in different categories of jobs. In the context of the large additional production which the private sector is to raise during the Third Plan some more facilities may require to be established and a certain measure of uniformity brought into the course of training.

33. *Transport.*—The concentration of coal production in the Bengal-Bihar coalfields poses serious problems of transport because coal has to move to consumers distributed all over the country. While the seriousness of the problem can be mitigated to some extent by increasing production in outlying coalfields, this cannot offer a complete solution of the problem as the better grades are not found in abundance outside the Bengal—Bihar coalfields, particularly the Raniganj field. The large increase in the coal production programme during the Third Plan will further increase the pressure on the railways for moving coal to distant consumers. The capacity of the railways is being increased but, with a view to reducing pressure on rail transport, it will be necessary (a) for consumers situated near coalfields, to move coal by road, and (b) to take steps to increase the quantity of coal moved by the rail-cum-sea route to consumers in southern and western India. Proposals for giving effect to such measures are under examination. The feasibility of consumers in Western and Southern India changing over to the use of furnace oil instead of coal, is also under consideration.

34. *Coal washeries.*—The steel programme included in the Second Plan required the establishment of capacity for washing 11·63 million tons of raw coal (8·1 million tons in terms of washed coal). Part of this capacity—6·03 million tons (4·1 million tons in terms of washed coal)—has already been established. The balance of washing capacity programmed under the Second Plan is expected to be established in full by the middle of 1963.

35. The expansion of steel production envisaged in the Third Plan is tentatively estimated to require an additional washing capacity of 12·7 million tons in terms of raw coal. This capacity has been arrived at after

use. The Fuel Efficiency Committee of the Coal Council, after taking into account all the technical aspects of the fuel requirements of each industry and having regard to the need for economy in the use of superior grades of coal, has laid down the types, grades and sizes of coal that should be supplied to different industries.

28. *Stowing.*—Stowing as a measure of conservation will need to be intensified during the Third Plan period since a part of the additional production is to come from existing mines by depillaring operations. While the larger collieries have their own arrangements for gathering sand and transporting it, for technical and financial reasons the smaller collieries are not able to establish these facilities. With a view to removing this handicap and to increasing the supplies of sand for stowing purpose, the Coal Board will establish seven ropeways, four in the Jharia coalfield and three in the Raniganj coalfield. Sand will be gathered from the Damodar and Ajai rivers and transported to points within convenient reach of groups of collieries which have been selected with due regard to the urgency of stowing operations, the quality of coal, etc. The cost of these ropeways has been tentatively estimated at Rs. 16 crores. The ropeways are programmed to be completed within the first two years of the Plan period, but this time-schedule may be upset by foreign exchange difficulties.

29. *Technical personnel.*—The Production and Preparation Committee of the Coal Council estimated the requirements of managerial personnel (degree-holders in mining engineering) at 3000 and of junior personnel at 37000. In addition, a certain number of engineering personnel (electrical, mechanical and civil) and technicians will also be required. The 3000 managerial personnel indicated above may be taken to represent the requirements of both coal mining and metalliferrous mining.

30. At the beginning of the Second Plan there were only two institutions, viz. the College of Mining and Metallurgy Banaras, and the Indian School of Mines and Applied Geology, Dhanbad, which provided facilities for a degree course in mining. The capacity of these two institutions was doubled in 1956-57. In addition, five Engineering Colleges and the Indian Institute of Technology, Kharagpur, have instituted courses in mining, each with an intake varying from 25 to 30 students per year.

31. The Chief Inspector of Mines has agreed to a certain measure of relaxation of the Coal Mines Regulations and also to the holding of two examinations annually for the grant of Mine Managers' Competency Certificate instead of one examination as at present. With the adoption of these measures, the requirements of managerial personnel will be more or less met. In regard to junior technical personnel, the establishment by the respective State Governments with central assistance of fourteen institutions for conducting the National Certificate Course in mining

37. *Neiveli Lignite Project.*—The project for the integrated development of the lignite deposits at Neiveli in South Arcot District (Madras) included in the Second Plan envisaged:

(i) an annual output of 3·5 million tons of raw lignite to meet the requirements of—

(a) a thermal power plant with a capacity of 250 M.W.,

(b) a fertiliser plant for the production of 70,000 tons of fixed nitrogen in the form of urea, and

(c) a briquetting and carbonisation plant for producing 380,000 tons of carbonised briquettes; and

(ii) a clay washing plant for the production of 6000 tons per annum of white China and ball clay.

The surplus power available after meeting the requirements of the constituent units of the integrated project is to be fed into the State electricity grid.

The mechanical removal of over-burden using both conventional and specialised types of machinery has reached an advance stage and production of lignite will commence by the end of 1961 in time to meet the requirements of the first unit of the thermal power plant. Production will be gradually stepped up thereafter to the target of 3·5 million tons visualised in the Second Plan as the other units of the thermal power station and the fertiliser and the briquetting and low temperature carbonisation plants are brought into commission.

The Third Plan envisages (a) the completion of the programmes included in the Second Plan, (b) expansion of thermal power capacity by 150 M.W., and (c) stepping up of the output of lignite from 3·5 million tons envisaged in the Second Plan to 4·8 million tons in order to meet the fuel requirements of the expanded thermal power plant. Item (b) above, which is estimated to involve a capital outlay of Rs. 15 crores with a foreign exchange component of Rs. 9·93 crores, is dealt with in paragraph 54 of the Chapter on Irrigation and Power. The expansion of mine output is estimated to cost Rs. 3·8 crores (with a foreign exchange element of Rs. 1·45 crores) mainly for the purchase of an additional unit of specialised mining equipment. This equipment will be sufficient to raise the output of lignite to 6 million tons which will be needed in due course to feed the proposed high temperature carbonisation plant for the production of lignite coke, vide paragraph 40 of the Chapter on Industries.

MINERAL OIL

38. The programme relating to mineral oil envisages (a) exploitation by the Oil India of the reserves proved in their leasehold areas in Assam, (b) further exploration by the Oil and Natural Gas Commission to locate

making allowance for blendable coal from the Dishergarh and Baraker Measures of the Raniganj field and blendable coal from Jhilimili which will be used directly without washing. This additional capacity is proposed to be established partly by the expansion of washeries already in existence or in course of erection, *viz.* doubling the capacity of the washeries being set up at Dugda and Bhojudih. This will take care of 3·2 million tons. The balance of washing capacity will be obtained by establishing two new washeries at Kathara (3 million tons), which will draw supplies from the Kathara mine, and from the Jarangdih, Sawang and Kargali deep mines; two washeries at Karanpura (3·5 million tons), which will draw supplies from collieries working the Argada and Sirka seams; and a washery in Central Jharia (3 million tons), which will be fed by the new mine to be opened in the Jharia coalfield by the National Coal Development Corporation. The washeries at Karanpura will be of a dual purpose. Washed slack coal will be supplied to the steel plants, while the washed steam coal will go to meet the requirements of the railways. Expansion of the washing capacity at Bhojudih and Dugda is not expected to involve any difficulty as the washability characteristics of most of the coal from the areas from which they will draw their supplies are already known. In the case of the washeries at Karanpura and Kathara, data for formulating preliminary project reports are being collected. The washery in Central Jharia will probably come into existence only towards the end of the Third Plan period as it will take sometime before the new mine is established and the washability characteristics of the coal ascertained. In addition to the above a washery is being planned to be set up as an integral part of the West Bengal coke oven plant at Durgapur.

36. Besides the above mentioned washeries which are mainly meant to cater for the requirements of the steel plants, the Plan includes washeries for non-coking coal required for use by the railways. The washing of non-coking coal is becoming necessary because of the gradual deterioration in the quality of coal mined today and the difficulty in getting adequate supplies of non-coking coal of superior grades. Unlike coking coal, non-coking coal is comparatively difficult to wash and data on the washability characteristics of these coals are rather scanty. Besides, the yield of washed steam coal for use by the railways will be much less than the yield of clean coal in the case of coking coal washeries. The programme, therefore, provides for detailed investigations of the washability characteristics of non-coking coal drawn from different collieries and a study of the economics of washing such coal. It is envisaged that the establishment of these additional washeries will be taken up when preliminary studies are over and the economics of washing such coals is established. Tentatively a capacity of 7 to 8 million tons (in terms of raw coal) is visualised.

Government have also decided to invite foreign oil explorers to join in the search for oil in India subject to mutually acceptable terms. One of the offers received is from the Burmah Oil Company (BOC), and a new basis for collaboration in the exploration and production of oil in Assam has been negotiated with this Company. The Government and the BOC will now become equal partners both in the share capital and in the management of Oil India (previously the Government had only a one-third share). As reconstituted, the company will operate in the existing areas of Nahorkatiya, Moran and Hugrijan as well as in a new area of 1886 square miles lying to the north-east of the existing area. Refining and marketing operations will continue to be the responsibility of the public sector, but supplies of crude oil to the Digboi refinery, which is owned by the Assam Oil Company, a subsidiary of BOC, have been assured to the extent that the Digboi fields cannot meet the requirements of that refinery. Oil India will afford the maximum possible employment and training facilities for Indian personnel and BOC will train Indians abroad in all fields of the petroleum industry at Oil India's expense.

Other offers received from foreign companies in response to the Government's invitation are under examination.

Trial production of crude oil at a daily rate of 1500 tons is expected to start by December, 1961, in the Ankleshwar area, and the estimated reserves would be able to sustain an annual production of 2 to 2·5 million tons. By the end of the Third Plan period indigenous production of crude oil is likely to reach a level of 6·5 million tons, and total production of indigenous crude oil would approximately be 18 million tons during the Third Plan period.

41. *Oil distribution.*—The Indian Oil Company, the Government agency set up in 1959 to undertake the distribution and marketing of oil products, has already concluded a four-year contract with the U.S.S.R. Export Organisation for the import of 1·9 million tons of deficit products, primarily kerosene and high speed diesel oil over that period. Similar imports are likely to be made from Rumania under corresponding trade agreements. To reduce the outgo of free foreign exchange on the import of deficit petroleum products, every effort will have to be made to increase such imports under rupee payments through the Indian Oil Company. In addition, the company will handle the distribution (directly or through quantitative equivalents by product exchange arrangements with other distributing companies) of the output of the two public sector refineries under construction and later of the third refinery projected in Gujarat. An investment of Rs. 10 crores is envisaged on the distribution programme during the Third Plan period.

and prove reserves of oil and establish additional production, (c) the completion of the refineries under construction at Gauhati and Barauni respectively, and establishment of a new refinery in Gujarat with a capacity of about 2 million tons, (d) establishment of pipelines for the transport of petroleum products, and (e) establishment of facilities for the distribution by Government agency of the products of the public sector refineries and the deficit products imported on favourable terms. Item (c) above is dealt with in paragraph 86 of the Chapter on Industries.

39. Additional wells will be drilled by Oil India in order to establish a sufficient number of production wells to feed the public sector refineries that are being established at Gauhati (Nunmati) and Barauni. Government's share of expenditure on this account is estimated at Rs. 1·4 crores during the Third Plan. The drilling programme and the laying of the pipelines will be so phased as to fit in with the time-schedule for the completion of the refineries. The programme envisages stepping up production of crude oil from Oil India's areas in Assam beyond 2·75 million tons per annum if additional reserves are proved in these areas. In that event or in the event of commercially workable reserves of oil being discovered in other areas of Assam, the capacity of the oil pipeline at present under construction may have to be increased so as to handle a large throughput. This has been borne in mind in designing the pipeline.

40. Even after Oil India has achieved full production from the Nahorkatiya area at the rate of 2·75 million tons per annum, the crude oil available from indigenous sources will fall far short of the country's needs. Intensive search for fresh oil reserves is, therefore, called for. In the Second Plan Government embarked on oil exploration on its own account through the agency of the Oil and Natural Gas Commission. The work of the Commission has led to the discovery of oil and gas in the Cambay-Ankleshwar area of Gujarat and the Sibsagar area in Assam. In the Third Plan, the Commission will operate on a larger scale with a view to proving oil reserves and establishing additional production.

The programme for the Third Plan envisages an expenditure of Rs. 115 crores as against only Rs. 26 crores in the Second Plan and will cover most of the promising sedimentary areas in the country, including the Cauvery basin. But the main effort, to begin with, will be concentrated on drilling in the Cambay-Ankleshwar and Sibsagar areas so as to establish production from the oil deposits discovered there. In the case of areas in which reserves of oil are proved and have been brought to the stage when production can start, funds required for developing production and pipelines will be provided in accordance with the requirements as assessed from time to time.

project, which is estimated to cost Rs. 17 crores, is also being developed with assistance from Japan. The expansion of output from Kiriburu which is estimated to cost about Rs. 6 crores will be so phased as to be ready to meet the requirements of the new steel plant at Bokaro when it is established.

46. Besides the above-mentioned projects, an additional production of 0·5 million tons from the Redi area (Maharashtra) by the National Mineral Development Corporation, 0·5 million tons from the Sukinda/Daiteri area by the Orissa Mining Corporation, and 1 million ton from the Bellary-Hospet area and along the West Coast by the Board of Mineral Development, Mysore, is also envisaged.

OTHER MINERAL PROJECTS

47. *Copper projects.*—Domestic production of copper is only of the order of 8000 tons per annum as compared with a current demand of the order of 70,000 tons, which is tentatively estimated to increase to about 150,000 tons by 1965. The major portion of the current demand for this metal is met by imports and unless domestic production is stepped up increasingly larger quantities will have to be imported.

48. Detailed work in the Khetri-Daribo area of Rajasthan and Rangpo area of Sikkim has established substantial workable reserves of copper ore—about 28 million tons with an average copper content of 0·8 per cent in Khetri and about 0·35 million tons averaging about 6·24 per cent of combined copper, lead and zinc in Rangpo; the occurrence in Daribo is richer in copper but the extent of the reserves are yet to be fully proved. The reserves proved in Khetri and those indicated in Daribo are considered adequate to feed a smelter with a capacity of 11,500 tons of electrolytic copper per annum. The Plan includes a project with an estimated capital outlay of Rs. 12·5 crores for the mining and concentration of the ore at Khetri and Daribo and smelting the concentrates at a smelter to be established at Khetri.

49. The reserves estimated to be available at Rangpo though richer in grade, are comparatively small in size. These are to be exploited by the Sikkim Mining Corporation, a joint venture of the Sikkim Durbar and the Government of India. The ore mined will be concentrated at the mine and will be railed to be smelted at one of the smelters in the country. The project is estimated to involve a capital outlay of about Rs. 2·5 crores.

50. *Pyrites—Sulphur Project.*—In the absence of workable deposits of elemental sulphur within the country attention has been focussed on pyrites as an alternative source of sulphur. Reserves of about 8 million tons of pyrites averaging about 40 per cent sulphur have been proved in the Amjor-Ghoga area in the Shahabad district (Bihar). The probable and possible reserves are estimated at 384 million tons. A project is being worked out for winning of about 84,000 tons of sulphur from pyrites.

42. *Products pipelines.*—The Plan visualises the construction of pipelines for transporting petroleum products from the refinery point at Barauni to consuming centres west of it and to Calcutta. Steps are being taken to get a project study made of the technical and economic aspects of the proposition. The pipelines visualised are estimated to cost Rs. 37 crores.

IRON ORE

43. On the basis of the target for iron and steel envisaged by the end of the Third Plan, the iron ore requirements are estimated at 20 million tons. In addition, iron ore has to be made available for export. Increasing interest is being shown in iron ore supplies from India by Japan and a number of countries in Europe. An agreement has been signed between the Government of India and Japan for the export of 2 million tons from the Kiriburu area and an additional 4 million tons from the Bailadila area in Madhya Pradesh. This will be over and above the current level of exports of about 2 million tons. Allowing about 2 million tons for export to other countries, the total requirements for export would be of the order of 10 million tons. To meet the requirements of domestic industries and this export target a capacity target of 32 million tons has been fixed for iron ore in the Third Plan.

44. The requirements of the Bhilai and Rourkela steel plants will be met from the mines that have been opened for the purpose during the Second Plan period. The capital cost of stepping up production from these mines to meet the expanded requirements is included in the cost of the expansion of these two steel plants. In the case of the Durgapur steel plant, the mine that has been developed during the Second Plan may not be able to meet the expanded requirements and it may become necessary to draw supplies of additional iron ore from the Kiriburu mines which are being developed to meet the export commitments to Japan. The target for the Bailadila project which was originally envisaged at 4 million tons has, therefore, been increased to 6 million tons. When the Bailadila mine is brought into full production, the export commitments to Japan will be met wholly from that area, thereby releasing the capacity at Kiriburu for meeting the requirements of the Durgapur steel plant. The iron ore requirements of the new steel plant at Bokaro will also have to come from the Kiriburu area either by expanding the capacity of the mines that are being developed or by establishing new mines nearby.

45. The Kiriburu iron ore project which is being developed with assistance from Japan is expected to start production in 1963. The Bailadila iron ore deposits are being prospected and a new mine for an ultimate production of 6 million tons per annum will be established and brought into production towards the close of the Plan period. This

MINERAL SURVEYS

56. While progress has been made on the survey of the country's mineral resources and good use has been made of the results obtained during the last ten years, the rapidly increasing demand for mineral raw materials requires that such surveys and investigations should be further intensified. The expansion of steel production has focussed attention on the need to locate fresh reserves of flux grade limestone and of dolomite and other refractory materials. Likewise, there is an urgent need to locate further workable reserves of non-ferrous metals like copper, lead and zinc, which are at present largely imported, and of bauxite, the demand for which will increase with the expansion of the aluminium industry. These urgent requirements call for a further expansion of the Geological Survey of India and the Indian Bureau of Mines and the Third Plan envisages a further expansion of these two organisations at an estimated cost of Rs. 10 crores and Rs. 5 crores respectively.

57. The Programmes of these two departments envisage both extensive and intensive investigations. The main objectives of their programmes are:

(i) Extension of the geological map coverage as quickly as possible—about 170,000 square miles are proposed to be covered during the Third Plan;

(ii) Intensive investigation of the known and reported occurrences of copper, lead and zinc. Besides studying the occurrences of these metals in a preliminary way during the course of geological mapping, the more promising ones will be mapped on a larger scale and investigated by geophysical methods and by drilling. The Base Metals Division of the Geological Survey of India will be expanded;

(iii) More detailed surveys and investigations followed, if necessary, by structural mapping and drilling, of deposits of other minerals like bauxite, gypsum, iron ore, manganese ore, chromite, graphite, limestone, etc.;

(iv) Further application of geophysical and geochemical methods to the investigation of non-ferrous metals and ground water resources; and

(v) Regional prospecting by the Geological Survey of India and detailed prospecting by the Indian Bureau of Mines of selected coalfields in connection with the coal programme during the Third Five Year Plan and to meet the needs of the subsequent Plan periods.

58. The more important items included in their programmes are set

51. *Panna Diamond Project.*—Preliminary work having given promising indications, the diamond bearing areas of Panna and adjacent regions in Madhya Pradesh are being prospected in detail with a view to establishing production of diamonds of the gem and industrial variety. The project is estimated to entail an outlay of Rs. 1·5 crores.

52. *Manganese ore beneficiation project.*—A large part of the manganese ore reserves available in the country are poor in quality. In addition, in the course of mining and grading the ore for export a certain proportion gets rejected as unmarketable. The dumps accumulated at the mines contain considerable quantities of this material. To conserve the rather limited reserves of high grade ore it has become necessary to set up facilities for the beneficiation of this material, and the Plan includes a project for this purpose with an estimated outlay of Rs. 5 crores.

53. *Gold.*—The Plan envisages a programme for further exploration and exploitation of the gold deposits in Kolar. In the Hutti gold mines the exploratory operations which are presently under way are expected to reach a concluding stage during 1962-63. The question of undertaking expansion of the mining and milling capacity to a thousand tons per day will be considered then in the light of the data that become available.

54. *Development of atomic minerals.*—In connection with the project for the establishment of an atomic power station, the Plan envisages the provision of facilities for the mining of uranium ore, the extraction of uranium and its processing to atomically pure metal or compound, and for the extraction of plutonium from fuel elements at an estimated cost of Rs. 24 crores.

Requirements of Mineral Raw Materials

55. The requirements of coal and iron ore for the programmes included in the Third Plan have been dealt with elsewhere. On the basis of the capacity envisaged for the different industries under the Third Five Year Plan the demand for mineral raw materials will increase. An estimate of the requirements of the more important minerals for domestic industries and an indication of the quantum of export visualised in the case of manganese ore are given below:

(million tons)

	domestic requirements	export
manganese ore	0·5	1·5
bauxite	0·45	..
gypsum	2·1*	..
limestone	29·8**	..

*This includes estimated requirements of Sindri Fertilisers, the proposed fertiliser factory at Hanumangarh and the cement target of 15 million tons.

**Inculdes the requirements of cement, steel, and ferro-manganese industries and a lumpsum estimate for the requirements of other miscellaneous industries.

CHAPTER XXVIII

TRANSPORT AND COMMUNICATIONS

THE rapid development of the economy over the past decade has placed demands on the transportation system, the magnitude of which is not generally appreciated. The railways, on whom the main burden falls, are handling today 100 per cent more freight traffic and 27 per cent more passenger traffic than they were handling before the commencement of the First Five Year Plan, and this despite the fact that at the beginning of the period the railways, as a result of the war, had heavy accumulations of over-aged stock and of track awaiting renewal. During the same period the capacity of the road transport industry has more than doubled and that of the major ports has also increased by about 85 per cent.

The experience of this decade should serve to focus attention on the crucial importance of transport and communications in economic planning. Although in both Plans a sizeable proportion of the total outlay was devoted to their development and this has made possible the considerable expansion in transport capacity that has taken place, nevertheless it is only with difficulty that the transportation system has been able to meet the growing demands. The railways in particular have, throughout most of the period, been working under some measure of strain and at times have been unable to handle all the traffic that has been offered. With the economy expanding at a rapid rate, it is likely that these conditions will persist at least for some years.

EXPERIENCE OF THE FIRST TWO PLANS—A BRIEF REVIEW

2. The following Table shows the outlay on the programmes relating to transport and communications in the first two Plans:

Table I: Outlay on transport and communications programmes in the First and Second Plans

(Rs. crores)

programmes	First Plan actual expenditure	Second Plan provision	Second Plan estimated expenditure
transport			
railways	258·5	900·0	860·1*
roads and road transport . . .	146·8	262·7	241·8

*Excludes Rs. 15 crores transferred from the plan of the railways to the plan of the Posts and Telegraphs Department and the power supply authorities in connection with the railway electrification programme and Rs. 3·5 crores transferred to the Ministry of Transport and Communications on account of Vishakhapatnam port.

out below:

Coal.—Detailed investigation followed by drilling of Singrauli, West Bokaro, Jhilimili, Pench-Kanhan and Singareni coalfields and of selected blocks of Raniganj and Jharia coalfields, in connection with the programmes in the public sector and regional mapping and drilling of Sonhat, Sohagpur, North Karanpura, Kalakot coalfields for purposes of qualitative and quantitative assessment.

Iron Ore.—Structural mapping of the iron ore belt in Bihar and Orissa and large-scale mapping followed by drilling of the deposits in Bailadila (Madhya Pradesh), Salem (Madras), Tumkur, Chitaldrug and Bellary-Hospet (Mysore).

Manganese Ore.—Exploratory drilling of the deposit in Panchmahals and selected areas in the manganese ore belt in Madhya Pradesh and some detailed studies of the deposits in Orissa and Rajasthan.

Chromite.—Detailed investigations of the deposits in Jojuhath (Bihar), Hassan and Mysore districts (Mysore), Cuttack, Keonjhar and Dhenkanal districts (Orissa).

Bauxite.—Detailed investigation of the deposits in Kaira and Jamnagar districts (Gujarat), Kolhapur (Maharashtra), Belgaum (Mysore), Amarkantak (Madhya Pradesh), Ranchi and Palamau districts (Bihar).

Limestone.—Search for flux grade limestone in Bihar, Madhya Pradesh and Orissa and investigation of limestone deposits in Mirzapur district (Uttar Pradesh).

Copper, Lead and Zinc.—Detailed mapping, geophysical investigation and drilling of the deposits in Cuddapah-Kurnool and Nellore districts (Andhra Pradesh), Hazaribagh, Santal Parganas and Monghyr districts (Bihar), Jubbulpore and Bastar districts (Madhya Pradesh), Panchekani (Sikkim), Almora and Garhwal districts (Uttar Pradesh), Udaipur district (Rajasthan), Riasi (Jammu & Kashmir) and Manipur.

Magnesite.—Detailed investigation of magnesite deposits in Almora (Uttar Pradesh) and Salem (Madras).

59. The programmes of the Geological Survey of India and the Indian Bureau of Mines in addition to providing training facilities for post-graduate students in applied geology and mining also envisage an exchange of personnel between universities and the Geological Survey of India with a view to enabling university teachers to gain field experience and the Geological Survey Officers to refresh their theoretical knowledge.

60. *States' programmes.*—In addition to the programme of mineral surveys to be undertaken by the Central Government, the plans of State Governments envisage the strengthening of their Directorates of Mines and Geology and the exploitation of certain mineral deposits. Among the more important items included therein are the exploitation of the lignite deposits in Palana (Rajasthan), coal in Kalakot (Jammu and Kashmir) and iron and manganese ores in Mysore.

had not fallen behind schedule mainly owing to lack of timely supplies of steel.

Table 2: Rolling stock on line as on 31st March, 1951, 1956 and 1961

(numbers)

rolling stock	1951	1956	1961 (estimate)
locomotives	8461	9172	10554
coaches (units)	20502	23155	28171
wagons (in terms of 4 wheelers)	222441	268493	341041

Over the ten-year period extensive line capacity works have been undertaken by the railways. These include the doubling of about 1300 miles of single track, the electrification of about 800 miles, the remodelling of a large number of existing yards and the construction of several new ones. The new lines added to the system have amounted only to about 1200 miles; in addition about 400 miles of lines dismantled during the war were restored during the period. The programme has been largely confined to lines needed either to meet the urgent operational requirements of the railways or in connection with the expansion of the iron and steel and coal industries.

4. There has been, on the other hand, a large extension of the road mileage over the last ten years. It is expected that the mileage of surfaced roads will have increased from 97,500 miles in 1950-51 to 144,000 miles in 1960-61, and that of unsurfaced roads from 151,000 to well over 250,000 miles. A sizeable expansion has also taken place in the capacity of the road transport industry over this period. The number of goods vehicles on the road nearly doubled—from about 81,000 in 1950-51 to 160,000 in 1960-61. The number of passenger vehicles, i.e., stage carriages, also increased during the period from 34,000 to about 50,000, i.e. by about 45 per cent. The increase in the capacity of the road transport industry has really been substantially more than is indicated by these figures; for the proportion of the heavier types of diesel vehicles to the total number of vehicles on the road has gone up considerably during the period.

5. The expansion in the capacity of the ports and harbours, particularly the major ports, over the period of the first two Plans, has also been substantial. During the First Plan the capacity of the major ports increased from about 20 million tons to 25 million tons. During the Second Plan their capacity is estimated to have increased to about 37 million tons. Several projects were taken up in the Second Plan which are still under execution and, on their completion, the total capacity of the major ports is likely to be over 45 million tons.

(Rs. crores)

programmes	First Plan actual expenditure	Second Plan provision	Second Plan estimated expenditure
ports and harbours	27·6	45·3	33·4†
shipping	18·7	47·7	52·7
civil air transport	23·2	43·0	49·0
other programmes in the transport sector	1·9	10·4	4·2
total—transport	476·7	1309·1	1241·2
communications			
posts and telegraphs	39·5	63·0	50·6
other communications including broadcasting	6·6	13·0	8·0
total—communications	46·1	76·0	58·6
total—transport and communications	522·8	1385·1	1299·8

As compared with the outlay in the First Plan, the provision for transport and communications in the Second Plan was, in absolute terms, considerably larger, and also somewhat larger in proportion to the total outlay, the share of transport and communications having risen from 27 per cent in the First Plan to 29 per cent in the Second. The progress on the programmes in this sector has, on the whole, been satisfactory.

3. The main task in the field of transportation in the First Five Year Plan was the rehabilitation of over-aged assets which had been subjected to great strain during the preceding decade. Large amounts had to be set apart for rehabilitation of railway rolling stock and for track renewal as also for replacement of over-aged shipping tonnage and equipment of ports and harbours. On account of the heavy replacement demands, the need for expansion could not be fully met in the First Plan. In the Second Plan again a large provision had to be made, particularly in the case of the railways, for rehabilitation of over-aged assets. The emphasis in the Second Plan, however, shifted to the programmes required to augment line capacity on different sections of the railways and to the procurement of additional rolling stock to meet the growing demand for railway transport arising from the increased production in the agricultural and industrial sectors of the economy. The rolling stock on line has been expanded as shown in the Table below. The wagon-holding of the railways at the end of 1960-61 would have stood at a higher figure than 341,041, if the programme for wagon procurement in the Second Plan

†Excludes expenditure met out of loans from IBRD and ports' own resources.

During this period, the freight traffic in terms of ton miles carried by road transport is estimated to have increased threefold, while passenger traffic in terms of passenger miles carried by stage carriages (excluding taxis and private cars) has more than doubled.

9. In the Second Five Year Plan, the total originating traffic on the railways was expected to increase from 120 million tons in 1955-56 to 181 million tons in 1960-61, i.e. by about 51 per cent. The provision in the Plan was considered inadequate to enable the railways to handle this traffic and it was expected that their capacity would fall short of the needs by about 10 per cent in respect of rolling stock and 5 per cent in respect of line capacity. According to the revised estimate made in 1958, the originating traffic on the railways was expected to increase to 168 million tons in the last year of the Second Five Year Plan and certain adjustments were made in the railway programme to enable them to take steps to acquire additional rolling stock. The volume of traffic actually carried by the railways in 1960-61 is estimated at 154 million tons. On account of a substantial increase in the average lead of traffic, however, the volume of traffic handled by the railways in terms of ton miles in 1960-61 is somewhat more than what was originally provided for in the Second Plan and the railways have recently been working under some strain. Difficulties have been experienced in the movement of coal, particularly from the Bengal-Bihar coalfields. This is partly due to changes in the pattern of coal production and in the plans for supply of raw materials to the steel plants, resulting in longer leads for the railways than were originally anticipated, and partly to a shortfall in some of the railway development programmes, notably wagon procurement.

10. *Viewed in retrospect, the experience of the last ten years is instructive from the point of view of future planning. The demand for transport has risen at a substantially faster rate than the increase in national income or the growth of production in any major sector of the economy over the period. While the national income has increased by about 42 per cent, the index of agricultural production has gone up by about 41 per cent and that of industrial production by 94 per cent, the traffic on the railways measured in ton miles has doubled and that on road transport more than doubled over the period. India's experience over the last decade is in line with the experience of several industrially advanced countries in their early stages of growth and these trends may well be expected to continue in the period of the next few Plans.**

Coordination of Transport: Approach in the Third Plan

11. The Committee on Transport Policy and Coordination (Neogy Committee), which was constituted in July, 1959, to advise on long-term transportation policy, and against the background of this policy, to define the role of the various means of transport in the next five to ten years,

*Committee on Transport Policy and Coordination: Preliminary Report (1961)

6. The tonnage of Indian shipping increased from about 3·9 lakh GRT in 1950-51 to about 4·8 lakh GRT at the end of the First Plan period and is estimated to have increased to about 9 lakh GRT at the end of the Second Five Year Plan. The expansion of tonnage on the coast, however, has been comparatively small—from 2·1 lakh GRT in 1950-51, the coastal tonnage is estimated to have expanded only to 2·9 lakh GRT in 1960-61.

7. The capacity of civil air transport has increased considerably since 1953 when the air services were nationalised. The capacity in ton miles offered by the Indian Airlines Corporation went up from about 46 millions in 1953-54 to about 69 millions in 1960-61 and that offered by Air India International over the period from 17 millions to 103 millions.

TRENDS IN RAIL AND ROAD TRAFFIC

8. The following Table shows the trends in traffic carried by railways and road transport over the period:

Table 3: Volume of goods and passenger traffic carried by railways and road transport* at the end of the First and Second Plans

(millions)

year	goods traffic			passenger traffic		
	railways		road	railways		road
	tons originating	ton miles	ton miles	passengers originating	passenger miles	passenger miles
1950-51	91·5	26980	3358	1284	41332	14374
1955-56	114·0	36434	5470	1275	38774	19559
1960-61 (estimated)	154·0	54700	10600	1624	48600	30000

The average lead of freight traffic on the railways has increased during the period from 292 miles to 354 miles. Thus, while in terms of tons originating, the volume of traffic on the railways has increased over the period by about 69 per cent, in terms of ton miles, it has gone up by over 100 per cent. The average lead of passenger traffic has declined during the period from 31·9 miles to 29·9 miles. This is because there has been relatively a much larger increase in suburban traffic than in the inter-city traffic carried by the railways. The figures for suburban passenger traffic are available only from 1951-52 onwards. The volume of suburban traffic increased from 4247 million passenger miles in 1951-52 to 7500 million passenger miles in 1960-61, i.e. by 77 per cent as against a 24 per cent increase in the overall passenger miles during the period.

*While the figures for railways pertain to the actual traffic carried over the Indian Government railway system, those for road transport represent only estimates worked out on certain assumptions regarding utilisation of vehicles quoted in the Preliminary Report of the Committee on Transport Policy and Coordination (1961).

be required before a decision is taken...one approach that could be considered is that in respect of lines which on technical studies are found to be of an unremunerative character, and have to be taken up either on strategic grounds or for other social and political considerations, Government or the parties concerned should subsidise the railways directly."

13. This leads to the third consideration which must be kept in mind. The Indian Railways are at present not merely solvent but are making a sizeable contribution to the resources for the Third Plan. On the other hand, in many countries railways in recent years have become losing concerns and in India too some unfavourable factors affecting the financial prospects of the railways have begun to manifest themselves to which the Committee on Transport Policy has drawn attention. The Committee has also raised questions with regard to the future of the railways' obligations towards the general exchequer. In view of the large fresh investments made in the Indian Railways over the past ten years and proposed for the Third Plan—the capital-at-charge of the railways increased from Rs. 834 crores in 1950-51 to Rs. 1559 crores in 1960-61 and it is expected to rise to Rs. 2313 crores by 1965-66—these matters assume considerable importance. Prima facie, it is desirable that financially the Indian Railways should not take the downward path followed by the railway systems in some other countries.

These and other issues pertaining to coordination of the various means of transportation in the country will be considered further when the final report of the Committee on Transport Policy and Coordination is available.

ALLOTMENT FOR TRANSPORT AND COMMUNICATIONS IN THE THIRD PLAN

14. The amount allotted for the programmes relating to transport and communications in the public sector in the Third Plan is Rs. 1486 crores, and is distributed between the various programmes as shown in the Table below:

Table 4: Provision for transport and communications programmes in the Third Plan

(Rs. crores)

programmes	provision
railways	890*
roads and road transport	297
shipping, inland water transport, ports and lighthouses	153†

* Excludes Rs. 350 crores to be contributed by the railways from their depreciation fund and Rs. 35 crores required by the railways for stores suspense account.

†Includes Rs. 20 crores expected to be contributed by the major ports from their own resources.

submitted its Preliminary Report to the Planning Commission in February, 1961. In its Report, the Committee has presented detailed factual material pertaining to road-rail coordination and has raised issues considered important from the point of view of formulating a long-term policy for the country. The Committee's final report is not expected to be ready for some time. When its recommendations become available, the programmes for transport in the Third Plan will be reviewed. There are, however, certain general considerations affecting the development of transport over the next few years which can appropriately be mentioned at this stage. In the first place, it must be recognised that during the Third Plan, the railways will inevitably have to continue to carry the bulk of the traffic in heavy goods like coal, iron ore and other materials for the steel plants, etc. As will be explained in a subsequent paragraph, about 88 per cent of the total additional traffic likely to be offered to the railways over the Third Plan period consists of such goods. Heavy investment on the railways is, therefore, unavoidable in order to enable them to handle this traffic.

12. Secondly, while there is a general shortage of transport in the country today, which is likely to continue for some time, this will not necessarily preclude competition between rail and road transport over certain routes and in respect of certain commodities. It is difficult at present to assess what will be the extent of such competition and what impact the expansion programme of the road transport industry will have on the railways and vice versa. The Committee on Transport Policy and Coordination is expected to suggest measures to secure coordination of rail and road transport. It is clear, however, even at this stage—indeed the Committee has drawn attention to it—that the railways in preparing detailed plans for increasing line capacity over various sections of the railway system will have to take account of the possible future development of road transport in the regions concerned. In regard to proposals for the construction of new railway lines considerations of coordination have still greater importance. As in the first two Plans, most of the new lines to be opened in the Third Plan are required either to meet the operational needs of the railways or for the movement of basic commodities like coal and mineral ores. But there have been numerous other demands for new lines from all over the country. The Committee on Transport Policy and Coordination has referred to the experience of some of the industrially advanced countries where, in recent years, railways have had to close down a number of unremunerative branch lines. It has also pointed out that the volume of traffic handled on certain new lines constructed or relaid in India during the past ten years is much below the capacity of these lines which thus remains under-utilised. The Committee has raised the question whether any well-defined criteria could be laid down on the basis of which proposals for new lines could be selected from time to time as part of the railway development programme. According to the Committee, "where a choice exists between a railway line and a road, careful examination may

In regard to three basic industries, namely, iron and steel, coal and cement, calculations of transport requirements have been made on the basis of the estimated production and the probable location of the production units. The estimate of traffic in respect of steel and the raw materials of steel corresponds to a production target of 8·3 million tons of finished steel and pig iron which includes about one million tons from the Bokaro steel plant. The estimate in respect of coal at 90 million tons corresponds to a production target of 97 million tons, the difference of 7 million tons being explained by consumption at collieries and the anticipated movement of coal by means of transport other than the railways. The estimate may have to be reviewed when further detailed studies of the likely short distance movements of coal to the washeries have been completed.

As regards traffic in general goods, the estimate provides for 22·5 million tons of railway materials and 11 million tons of iron ore to be moved by rail for export. This last figure includes 4 million tons of iron ore from Bailadilla expected to be reached in 1966. Taking into account the quantity of iron ore to be moved by road to certain minor ports, the total capacity for movement of iron ore for export in 1966 is estimated at about 13 million tons. As regards the rest of the commodities in this group, a careful study was made of the past trends in rail movement with reference to production, imports and exports of some of the more important commodities, such as raw cotton, textiles, jute manufactures, salt, paper, sugar and foodgrains. Altogether, the estimate provides for an additional 11·5 million tons of traffic in respect of commodities other than iron ore for export and the railways' own materials, over the existing level of about 64 million tons carried by the railways or an increase of 18 per cent over five years. Over the Second Plan period the traffic in these commodities is estimated to have increased by about 8 million tons, i.e. from 56 million tons in 1955-56 to about 64 million tons in 1960-61.

16. In respect of passenger traffic, the railway programme provides for an increase of 3 per cent per annum in the non-suburban traffic. As regards the suburban traffic, the increase, to judge from past experience, is likely to be of a substantially higher order. The intention is to provide during the peak periods the maximum possible frequency of train services with such marginal increases in line capacity as may be called for.

17. In the nature of things, the traffic requirements five years hence cannot be calculated very precisely. In the first place, the location of some of the important units in industries like coal and fertilisers is still not definitely known, and it is not possible to forecast precisely the pattern of traffic in these commodities. In the case of the coal industry particularly, it is difficult to foresee the exact impact on the average distance

programmes	(Rs. crores) provision
civil air transport	55
posts and telegraphs (including teleprinter factory)	68
tourism	8
broadcasting	7
other transport and communications	8
total	1486

In the case of some of the programmes which have been included in the Plan, the estimated cost is more than the amount proposed to be allotted in the Plan. This is particularly so in the case of railways, roads, major ports and posts and telegraphs. Detailed information in regard to the physical content of the programmes and their estimated cost is given in the paragraphs that follow.

DEVELOPMENT PROGRAMMES FOR THE THIRD FIVE YEAR PLAN

RAILWAYS

15. *Traffic targets.*—The railway development programme in the Third Five Year Plan has been formulated on the basis of the originating traffic reaching a figure of about 245 million tons in 1965-66, i.e., the last year of the Third Plan. The volume of traffic is thus expected to increase over that in 1960-61 by 91 million tons, i.e. by about 59 per cent. A broad break-up of this traffic as between various commodities is indicated in the Table below:

Table 5: Estimate of originating goods traffic on the railways in the Third Plan.

(million tons)

commodity	1960-61	1965-66	increase in 1965-66 over 1960-61
steel and raw materials other than coal for steel plants	13·0	34·0	21·0
coal (including coal moved on railways' own account)	49·5	90·0	40·5
cement	6·5	12·0	5·5
general goods including railway materials excluding coal	18·0	22·5	4·5
iron ore for export	3·0	11·0*	8·0
all other goods	64·0	75·5	11·5
total for 'general goods'	85·0	109·0	24·0
total	154·0	245·0	91·0

*Includes capacity of 4 million tons of exports from Bailadilla area through Visakhapatnam to be reached in 1966.

programmes	estimated cost
	(Rs. crores)
signalling and safety works	25
traffic facilities (line capacity works)	183
bridge works	25
other electrical works	8
other structural works	15
staff quarters and staff welfare	50
users' amenities	15
road services	10
stores suspense	35
total	1325

20. *Rolling stock programme.*—The programme for rolling stock provides for the acquisition of stock needed to cater for the anticipated increase in traffic and also for the replacement of over-aged stock as indicated below:

Table 7: The railway rolling stock programme in the Third Plan

(numbers)

programmes	locomotives	coaching vehicles	wagons (in terms of 4—wheelers)
addition	1150	5025	90447
replacement	614	2854	26697
total	1764	7879	117144

In estimating the requirements for additional stock the operational improvements achieved and planned by the railways and the provision of facilities for mechanised handling of coal and iron ore at the terminals have been taken into account. The turn-round time of wagons in respect of specified bulk movements of coal and other raw materials to the steel plants has been estimated on the basis of the actual distances of haulage. In the case of all other traffic, the turn-round time of wagons is estimated to be reduced on the broad gauge system from about 11 days as at present, to 9·5 days by the end of the Third Plan period, and in the case of metre gauge system from about 8 days to 6·5 days. This would represent an appreciable improvement in the performance and the railways will make every effort to achieve these targets.

21. In drawing up the rehabilitation programme, the railways have been guided by their actual experience of condemning the over-aged stock on condition basis during the period of the Second Plan. The percentage of over-aged locomotives, coaches and wagons to the total on

of haul of the changes in the pattern of production envisaged in the Third Plan in so far as a substantial part of the production is expected from fields other than the Bengal and Bihar coalfields. Secondly, in respect of some important commodities like iron ore and steel, because of increased production within the country, the pattern of future movement may be very different from what it has been in the recent past. Thirdly, as stated earlier, it is difficult at this stage to define precisely the respective spheres of rail and road transport in the country, although that part of the additional traffic in the Third Plan in respect of which railways and road transport would appear to be competitive, is comparatively small. Of the total increase of 91 million tons of freight traffic to be carried by the railways by the end of the Third Plan period, 79·5 million tons are accounted for by coal, steel and the raw materials of steel, cement, iron ore for export and the railways' own stores, and only the remaining 11·5 million tons represent an increase in general goods. It has been assumed that 20 per cent of the additional traffic in general goods during the Third Plan period will be carried by back-loading of empty wagons. The provision for rolling stock for this traffic has been correspondingly reduced.

18. The development programmes for coal and certain other important industries have not yet all been worked out in full detail. As their exact nature and requirements become clear, it will be possible to coordinate the railway programme with them more closely so as to ensure that they move forward in harmony and that their phasing and implementation are carefully synchronised.

Furthermore, since the overall estimates of traffic can only be treated as tentative at this stage, they will be subject to constant review in the light of the actual trends in traffic from year to year.

19. *Railway development programme.*—The cost of the railway development programme as at present formulated, including Rs. 35 crores required on stores suspense account, is estimated to be of the order of Rs. 1325 crores. The break-up is as follows:

Table 6: Railway development programme in the Third Plan

(Rs. crores)

programme	estimated cost
rolling stock	510
workshops, machinery and plant	62
track renewal	170
new lines	147
electrification	70

24. *Electrification.*—The programme includes provision for electrification of about 1100 miles where the replacement of steam traction is considered necessary for operational reasons having regard to the density of traffic already reached and the expected increase in traffic. The programme provides mainly for the completion of work on those sections which were taken up for electrification in the Second Plan; the majority of these serve the steel plants and the coal mining regions. The only new section which, for the present, is proposed to be taken up during the Third Plan period is that from Mughalsarai to Kanpur. The electrification of this section is required mainly in connection with the future movement of coal.

25. *Track renewal.*—The renewal of track is necessary for safety reasons, and to speed up the movement of trains so as to increase the line capacity. A sizeable programme for track renewal was taken up in the First and the Second Plans. Nevertheless, there will still be arrears to be made good during the Third Plan period. Provision was made in the Second Plan for complete track renewal of about 8000 miles. The progress on the programme has been satisfactory and only a small shortfall is expected on account of difficulties in the supply of track materials. The programme in the Third Plan provides for over-taking a large part of arrears of track renewal by the end of the Plan period. Provision is made for complete track renewal over about 5000 miles, rail renewals over about 2500 miles, and renewal of sleepers over about 2250 miles. It is also proposed to undertake welding of track joints on an extensive scale during the Third Plan period.

26. *Signalling and safety works.*—The programme for signalling and safety works provides for improvement of signalling and telecommunication facilities including the inter-locking of some sections as a safety measure. Centralised traffic control will be provided on the link route leading to Assam. Automatic signalling will be extended on some of the suburban sections and on those busy sections expected to handle heavy traffic in coal and other goods, where such signalling is considered to be absolutely necessary. Moreover, the standards of signalling on trunk routes will be improved to permit speedy movement of trains and improved telecommunication facilities will be provided on important trunk routes, marshalling yards and other important centres of operation.

27. *New lines.*—Provision is made for the construction of about 1200 miles of new lines during the Third Plan period. Besides the new lines carried forward from the Second to the Third Plan, namely, Garhwa Road-Robertsganj, Sambalpur-Titlagarh and Bimlagarh-Kiriburu, the programme provides for the following further new lines: Jhund-Kandla, Madhopur-Kathua, Udaipur-Himmatnagar, Delhi avoiding lines, Diva-Panvel-Kharpada with extension to Uran, Patharkandi-Dharmanagar, Guna-Maksi, Ranchi-Bondamunda, Hindumalkot-Sriganganagar, Ghaziabad-Tughlakabad, Bailadilla—Kotavalasa, and the new line to Haldia

the line as proposed to be achieved at the end of the Second and the Third Plans is indicated in the Table below:

Table 8: Percentage of over-aged stock to total stock on line at the end of First, Second and Third Plans

year	broad gauge locomotives	broad gauge coaches	broad gauge wagons	metre gauge locomotives	metre gauge coaches	metre gauge wagons
1950-51	23·0	29·5	13·3	31·0	45·0	29·4
1955-56	33·2	32·3	18·0	25·8	32·7	21·0
1960-61	26·7	34·4	10·2	17·9	28·1	11·7
1965-66	27·2	26·8	11·6	18·6	18·7	11·4

22. *Workshops.*—The programme for workshops provides for additional facilities for workshops, sick lines and sheds such as are considered necessary in view of the increased holding of rolling stock on the railways. Provision is also included for the manufacture of diesel locomotives. The capacity for the production of broad guage steam locomotives at Chittaranjan Locomotive Works is considered sufficient to meet the demand for such locomotives during the Third Plan period and will not be increased further. It is proposed, however, to establish the production of electric locomotives at Chittaranjan in collaboration with the Heavy Electricals Ltd., Bhopal.

23. *Line capacity works.*—The increase in demand for rail transport capacity measured in terms of tons originating over the period 1960-61 to 1965-66 is expected to be of the order of 60 per cent. The railway development programme provides for doubling over 1600 miles of single track and for other line capacity works like remodelling of yards, opening of crossing stations, and provisions of crossing loops, etc. The main consideration in formulating the line capacity works is to strengthen the trunk routes and the lines on which traffic in heavy commodities like coal and iron ore is required to be moved in increased quantities in future. In formulating programmes for development of line capacity, the railways have taken into account the technological improvements that may be achieved in the Third Plan including the use, to a substantial extent, of new bogie wagons with centre buffer couplers for bulk movement of coal from collieries to important consuming centres where dumps are proposed to be opened for unloading coal in bulk. An important objective underlying the railway development programme is to increase gradually the train loads so as to reduce the investment which will otherwise be necessary on line capacity works. The movement of coal in heavy train loads in the new bogie wagons loaded from overhead bunkers which are to be provided at the major collieries is a basic feature of the railway development programme in the Third Plan.

31. *Users' amenities.*—Provision for users' amenities has been kept at the level of the Second Plan. The programme includes provision for remodelling of stations, retiring rooms, waiting accommodation and refreshment rooms, construction of foot overbridges and improved water supply arrangements, latrines and bathing facilities as also provision of electric lights and fans at railway stations. On account of the limited funds available, the schemes in this regard are proposed to be drawn up on austerity standards.

32. *Measures to achieve self-sufficiency.*—The railway development programme in the Third Plan has continued to keep in view the objective of attaining self-sufficiency in regard to the requirements of the railways. There has already been a substantial increase in the capacity for the manufacture of rolling stock during the Second Plan period, and all the steam locomotives, coaches and wagons required by the Indian Railways are being produced within the country. Complete self-sufficiency has also been achieved in respect of mechanical signalling equipment and the manufacture of electric signalling equipment has been started. Capacity is being created to produce within the country the entire supplies of track materials required by the Indian Railways. To the extent possible, efforts will be made in the Third Plan period to manufacture diesel and electric locomotives and other items of equipment which are still being imported. The requirements of foreign exchange for the railway development programme in the Third Plan are estimated at Rs. 186 crores, as against Rs. 332 crores estimated to have been actually spent during the Second Plan period.

ROADS

33. The road development programmes in the first two Plans were formulated in the perspective of the post-war road development plan, known commonly as the 'Nagpur Plan', which was drawn up as far back as 1943. The Plan as applied to the post-partition India envisaged completion of a total length of 123,000 miles of surfaced roads and 208,000 miles of unsurfaced roads. With the programmes undertaken in the First and the Second Plans, the targets envisaged in the Nagpur Plan have been exceeded both in regard to surfaced and unsurfaced roads. By the end of the Second Plan period, the mileage of surfaced roads in the country is expected to be 144,000 and that of unsurfaced roads well above 250,000. Despite this considerable expansion of the road mileage over the last ten years, the road network remains deficient in certain respects, such as unbridged river crossings, substandard surface, narrow carriageway, etc. About 60 per cent of the total mileage consists of earth roads only. Of the total road mileage in the country, about 15,000 miles constitute the National Highways but only about 2300 miles of these have a two lane carriageway; the rest is all one lane. There are also about

Port. The programme for new lines in the Third Plan also provides for construction of 200 miles of new lines required in connection with the development of the coal industry. This part of the programme has not yet been finalised.

28. The following new lines are under consideration for inclusion in the railway programme: (i) Mangalore-Hassan, (ii) Bangalore-Salem, (iii) Manamadurai-Virudhunagar, and (iv) the rail link from Sukinda/Daitari mining areas in Orissa to the main line from Kharagpur to Cuttack. The Mangalore-Hassan line would be necessary in connection with the export of iron ore through Mangalore which is proposed to be developed as a major port. The Bangalore-Salem line would serve the requirements of industrial development at Salem. The Manamadurai-Virudhunagar line would provide an alternative link between these two stations and thus relieve the pressure on the existing lines from Manamadurai to Madurai and from Madurai to Virudhunagar. The rail link to mining areas in Orissa is required in connection with export of iron ore through Calcutta, the proposed port at Haldia and the port of Paradip.

Besides the new lines mentioned above, some railway facilities may have to be provided in connection with irrigation, power or mineral projects. The Railway Board, in addition, have proposed certain other new lines for consideration.*

29. *Bridge works.*—The programme for bridges is confined mainly to the works carried forward from the Second Five Year Plan; the two major bridges taken up during the Second Plan period are the one over the Brahmaputra in Assam and the second over the Jamuna at Delhi. New bridges are proposed on the Rourkela-Drug and Godra-Ratlam sections which were being doubled during the Second Plan period. The programme also provides for rehabilitation of several of the existing bridges during the Plan period.

30. *Staff quarters and staff welfare.*—Of the total amount of Rs. 50 crores proposed under this head, Rs. 35 crores are intended for construction of staff quarters and Rs. 15 crores for provision of staff amenities. It is proposed to provide about 54,000 new quarters in the Third Plan in addition to the quarters that will be constructed as part of composite projects. The programme for amenities provides for expansion of medical facilities and improvement in the staff quarters, drainage, water supply and electrification and recreational facilities in the workers' colonies, etc. Provision has also been made for schools and hostels under this programme.

*The lines proposed by the Railway Board are the following: (1) extension of Bukhtiarpur-Rajgir line to join Grand Chord near Manpur, (2) Poona-Miraj (conversion from metre gauge to broad gauge), (3) B.G. line from Renigunta to Tirupati, (4) Kathua-Jammu, (5) Tinnevelly-Cape Comorin, (6) Chandigarh-Ludhiana, (7) Ratlam-Banswara and (8) Dharmnagar-Deo River Valley.

difficult to say what additions will be made to the road mileage within the amounts that have been allocated in the Plan. It is, however, roughly estimated that it will be possible to add about 25,000 miles of surfaced roads to the existing network as against about 22,000 miles added during the Second Plan period. The programmes for construction of new roads have to be formulated having regard, on the one hand, to the need for providing road connections to inaccessible areas, and on the other, to the requirements arising from projects in other sectors, such as, irrigation, power and industry. Where necessary, the requirements of road development arising from the reorganisation of States have also to be kept in view. A substantial part of the provision for road programes in the State plans is intended for improvement of the existing roads with a view to enabling them to meet the requirements of increasing traffic, particularly heavy vehicular traffic; these include widening the roads and upgrading their surfaces and providing missing links and bridges, etc.

37. *Central road programmes.*—The programmes in the Central sector provide mainly for the improvement of the existing National Highways system. Within the amount available, it will be possible only to add one more road to this system, viz., the road from North Salamara to the Brahmaputra bridge with a length of about 100 miles. It may, however, be mentioned that roads totalling about 1200 miles were added to the system quite recently. In the Second Plan, the programme for National Highways provided for the construction of 700 miles of missing links and 40 major bridges, the improvement of 1500 miles of existing sections and the widening of 900 miles to two lane carriageway. All the targets in the National Highways programme have been fully achieved except in respect of missing road links, the work on which is somewhat behind schedule. The more important works completed under the programme include the construction of both the Western and the Eastern tubes of the Jawahar Tunnel on the Jammu-Srinagar highway, the construction of the section of the National Highway from Raiganj in West Bengal to Dalkhola in Bihar and widening of the Delhi-Agra road. The more important bridges constructed during the Second Plan period are the rail-cum-road bridge over the Ganga at Mokameh in Bihar, the submersible bridge over the Chambal in Madhya Pradesh, the regulator-cum-road bridge across the Krishna river in Andhra Pradesh, the bridge over the Mahe in Gujarat and the bridge over the Pooniar river on the Madras-Dindigul road. The programme in the Third Plan provides for the completion of a number of important road and bridge works carried forward from the Second Plan. The programme also provides for the improvement of a few sections of the new highways added recently to the National Highways system and for the construction of the Vivekanand bridge by-pass near Calcutta and a few missing links on the existing highways.

1000 miles of National Highways which have only one lane water-bound macadam or low surface instead of cement concrete or bitumen surface. The National Highways as well as the State Highways have a crust thickness of nine to ten inches which, according to technical experts, is inadequate for the present volume and intensity of traffic. Moreover, there are numerous missing bridges on the arterial routes. On the National Highways alone about 80 major bridges remain to be provided at the end of the Second Five Year Plan. Work on 47 of these is in various stages of progress.

34. *The Objectives and Priorities of Road Development in the Third Plan.*—The road development programmes for the Third Plan have been formulated in accordance with the broad objectives laid down in the twenty-year road development plan for the period 1961-81, which has been recently drawn up by the Chief Engineers of the State and the Central Governments. The broad objective of this Plan is that no village in a developed and agricultural area should remain more than four miles from a metalled road and more than 1½ miles from any type of road. The Plan takes into account the special requirements of undeveloped and underdeveloped areas. Under the Plan, the total mileage proposed to be reached at the end of the twenty-year period, i.e., in 1981, is 252,000 miles for surfaced roads and 405,000 miles for unsurfaced roads.

The broad order of priorities envisaged in the twenty-year plan, is that (a) on all arterial routes missing bridges should be provided and the road surfaces improved at least to one lane black topped specification, (b) the main roads in the vicinity of large towns should be widened to two lanes or more and (c) the major arterial routes should have at least two lane carriageway. According to the Plan, the first task in regard to rural roads should be their improvement to fair-weather standard. In regard to these priorities, it may be emphasised that during the past ten years there has been an increasing demand for district and village roads whose improvement benefits directly millions living in the rural areas. This demand has to be kept in view while considering the targets for various types of roads in the Third Plan.

35. The expenditure on road development in the Second Plan is estimated to be about Rs. 224 crores. The cost of the road development programmes included in the Third Plan is about Rs. 324 crores—the programmes in the State sector are estimated to cost about Rs. 244 crores and those in the Central sector Rs. 80 crores. The latter cover both National Highways and roads of inter-State and economic importance.

36. *State road programmes.*—A large part of the road construction programme falls within the purview of the State Governments. The road programmes in the State plans are still being formulated, and it is

The programme in the Third Five Year Plan provides for experiments in road construction on the basis of new specifications and techniques. In order to facilitate a proper assessment of the results of the research already carried out and help select schemes for further research, it is proposed to constitute a Central Assessment Committee consisting of representatives of the various Central and State Government organisations and of certain non-governmental organisations connected with road development and road research activities. The field experiments on new techniques in the Third Five Year Plan will be carried out following the recommendations of this Committee.

ROAD TRANSPORT

42. During the last two decades, there has been a noticeable expansion of motor transport in the country, particularly in the case of goods vehicles. The number of goods vehicles in undivided India (excluding princely States) increased from 12,397 in 1938-39 to 40,107 in 1946-47. After the partition of the country, the number of goods vehicles in the Indian Union has almost doubled in a period of ten years—from about 73,000 in 1948-49 the number has gone up to about 160,000 in 1960-61. As regards passenger vehicles, their number went down during the early years of the war but increased subsequently so that the total number in 1946-47 was almost the same as in 1938-39. From 1948-49 onwards the number of these vehicles has been increasing steadily. It rose from 27,275 in 1948-49 to about 50,000 in 1960-61—an increase of about 85 per cent.

43. As explained earlier, the increase in the volume of the traffic carried by road transport has in recent years been proportionately a good deal more than the increase in the number of vehicles because there has been a significant increase in the capacity of vehicles over the period. Had the targets for the manufacture of vehicles laid down in the Second Plan been realised fully, the increase in the number of vehicles and the capacity of the road transport industry would have been greater still. As against the target of 40,000 vehicles set in the Second Plan, the actual production in 1960-61 is expected to be of the order of 30,000. The insufficient supply of new vehicles, particularly during the last few years, which is attributable to the shortage of foreign exchange, is the principal factor which has stood in the way of more rapid expansion of road transport during the period. Several measures were taken in recent years to liberalise the licensing policies for road transport. Efforts are also being made to assist the road transport industry by simplification of the various taxes imposed on the industry. In particular, the Ministry of Transport and Communications has requested the State Governments to consolidate all the existing taxes into a single levy to be collected by one agency as far as possible, and to consider abolishing double taxation of road transport services on inter-State routes.

38. The programme of inter-State roads and roads of economic importance in the first two Plans provided, among other projects, for the West Coast road, the Passi-Badarpur road, the Pathankot-Udhampur road and the roads required in connection with export of iron ore in Mysore, Orissa and Andhra Pradesh States. Up till 1960-61, about 1000 miles of roads were constructed and about 2300 miles improved under this programme. A number of schemes undertaken during the Second Plan period will have to be completed in the Third Plan. It is estimated that about Rs. 22 crores will be required for this purpose. It may be possible to take up a few new schemes under this programme.

39. *Special needs of backward areas.*—As in the Second Plan, in deciding the provisions to be made for road programme in the Third Plan, special consideration has been given to the needs of the areas which are comparatively backward in regard to means of communications. Thus, in the plans of the Andaman and Nicobar Islands, Himachal Pradesh, Manipur, NEFA, NHTA and Tripura, about one-fourth to one-third of the total plan outlay has been allocated for road development. The States in which road development has been given high priority are Assam, Jammu and Kashmir, Madhya Pradesh and Rajasthan. Within the States themselves, larger provisions are proposed to be made for the comparatively less developed areas, e.g., the hill areas of Punjab, Uttarkhand, Bundelkhand and other hill areas of Uttar Pradesh, Vidarbha and Marathwada in Maharashtra, Telangana in Andhra Pradesh, the northern districts in Mysore and Kerala, Ladakh and Sonawari areas in Jammu and Kashmir and Tuensang area in NHTA.

40. *Rural road development.*—Special consideration is being given to road development in rural areas. Specific provisions have been set apart for this purpose in the plans of several States, apart from the provisions available for the development of rural roads under the programmes of local bodies and community development. As a result of an ad hoc enquiry instituted some time back by the Ministry of Transport and Communications, efforts have been made to draw up district plans showing the appropriate alignments of possible future roads in rural areas. Efforts are being made to achieve the desired coordination between the various agencies responsible for road development in rural areas and to secure in an increasing measure contribution from the people towards the construction of village roads.

41. *Road research.*—In the Third Plan, a certain portion of the allotment for road development programmes is being set apart for research. Altogether, Rs. 2 crores may be available for research programmes in the State plans, which will be utilised for field research as distinct from laboratory research. Research on modern techniques of road construction is being done by the Central and State road research laboratories with a view primarily to achieving economies in the cost of construction.

its activities in the field of transport of goods by road. A number of questions, such as the forms of organisation and the scope of the programme, will be considered further in the light of the recommendations of the Committee on Transport Policy and Coordination and in consultation with the State Governments.

INLAND WATER TRANSPORT

47. Inland waterways play an important role in the north east region of the country comprising the States of Assam, West Bengal and Bihar. Of the existing traffic of over 2·5 million tons between Assam and Calcutta, about one half is carried by river and the remaining half is shared between the railways and other means of transport. In the south, inland water transport has a significant part to play in the State of Kerala. The waterways in Kerala connect several minor ports and the major port of Cochin and a number of industries are situated close to them. In the deltaic region of Orissa, again, inland waterways provide an important means of communication; the principal navigation canals serving the region are the Kendrapara and Taldanda Canals and the Orissa Coast Canal. Inland water transport operates in a limited way in the States of Andhra Pradesh and Madras also. The problems of inland water transport have been studied in detail by the Inland Water Transport Committee which submitted its report to the Ministry of Transport and Communications in 1959. The Committe has made long-term proposals for the development of inland waterways all over the country. The programme for the Third Five Year Plan has been formulated in the light of the recommendations of the Committee. The progress on programmes in this sector in the first two Plans has been slow, mainly because of the long time required in the formulation of schemes and the designing of the craft, etc. As against less than Rs. 1 crore spent over the period of the first two Plans, the cost of the programmes included in the Third Plan is Rs. 7·5 crores, which includes Rs. 6·0 crores in the Central sector and Rs. 1·5 crores in the State plans.

48. An important step taken for the development of inland water transport during the First Five Year Plan was the setting up of the Ganga Brahmaputra Board—a joint venture of the Central Government and the State Governments of Uttar Pradesh, Bihar, West Bengal and Assam. The Board was assigned the task of coordinating the activities of the participating Governments in regard to the development of water transport on the Ganga and Brahmaputra System and of administering pilot projects for testing the feasibility of operating modern craft on shallow waterways. The Board at present operates (a) the country boat towing service between Chapra and Burhaj, a distance of 94 miles, and (b) a weekly service between Patna and Buxar (93 miles) and Patna and Raj-

44. The expansion of commercial road transport in the Third Plan will depend largely on the manufacturing capacity of the automobile industry. The targets for production of vehicles recommended by the Ad hoc Committee on the Automobile Industry (1960) have been accepted by Government for the purpose of formulating the manufacturing programme in the Third Plan. The production target for commercial vehicles in 1965-66 is 60,000, which is twice the level of production in 1960-61. It is roughly estimated that the total number of commercial vehicles will increase from about 200,000 in 1960-61 to 365,000 in 1965-66, i.e. an increase of about 82 per cent. The number of goods vehicles will increase over the period from about 160,000 to 285,000 and the number of stage carriages from about 50,000 to 80,000. According to the calculations presented in the Preliminary Report of the Committee on Transport Policy and Coordination, the increase in freight traffic by road is expected roughly to be of the order of 120 per cent over five years, i.e. from about 10,600 million ton miles in 1960-61 to 23,350 million ton miles in 1965-66.

45. The expansion programmes of the nationalised road transport undertakings in the States, which at present provide largely passenger services, are estimated to cost Rs. 26 crores in the Third Plan. It is expected that about 7500 vehicles will be added to the fleets of the nationalised undertakings during the period of the Plan as compared with about 5000 vehicles added during the Second Plan period. The share of the nationalised undertakings in the total passenger services by road is expected to remain unchanged at the existing level of about 30 per cent. The Planning Commission had some time back advised the State Governments to set up corporations under the Road Transport Corporations Act, 1950, to manage the nationalised road transport undertakings in which the railways, and, if possible, the private operators should participate. The principal reason underlying this policy decision was the need to ensure that the State Government undertakings, which are likely to grow into large monopolies in future, do not come into unfettered competition with the railways, which are a Central Government monopoly. The corporation form of management provides some safeguard against undue competition between them. The Committee on Transport Policy and Coordination in its preliminary report has unanimously endorsed this policy. Corporations have already been set up in several States and it is hoped that the remaining States will also set up corporations as early as possible. Provision has been made in the Plan for the railways to contribute their share to the expansion programme of the nationalised road transport undertakings in the States.

46. In view of the great pressure on railway transport and the need for coordinated development of various forms of transport, in the course of the Third Plan, it may be necessary for the public sector to extend

The targets for overseas and coastal shipping by the end of the Second Five Year Plan were 4·9 and 4·1 lakh GRT respectively. The actual achievement in respect of overseas tonnage has exceeded the target, while in the case of coastal shipping there is a substantial shortfall. A sum of Rs. 18·7 crores was spent on the shipping programme in the First Plan and the expenditure in the Second Plan is estimated at Rs. 52·7 crores. An important step taken during the Second Plan period has been the establishment of a non-lapsing shipping development fund for grant of loans to shipping companies for the acquisition of tonnage.

51. A provision of Rs. 55 crores has been made for shipping in the Third Plan. In addition, a sum of Rs. 4 crores is likely to be available from the Shipping Development Fund. The shipping companies are expected to contribute Rs. 7 crores from their own resources. A little more than one half of the total amount is proposed to be spent in the private sector and the balance on the programmes of the two Corporations in the public sector, namely the Eastern Shipping Corporation and the Western Shipping Corporation. It is expected that about 57 ships with a tonnage of 375,000 GRT will be acquired during the Plan period. Of the total tonnage, about 194,000 GRT are estimated to be required for replacement of over-aged ships and the remaining 181,000 GRT will be available for addition to the existing tonnage. This will increase the total tonnage available to 1·1 million GRT. About 216,000 GRT will be acquired in the private sector and the remaining 159,000 in the public sector.

52. The following Table gives the break-up of the tonnage proposed to be acquired during the Third Plan between coastal and overseas trades, both in the private and the public sectors:

Table 10: The shipping tonnage to be acquired in the Third Plan

(GRT)

item	private sector	public sector	total
coastal			
replacement	100000	..	100000
addition	25000	7500	32500
total coastal	125000	7500	132500
overseas			
replacement	56000	37600	93600
addition	35200	113200	148400
total overseas	91200	150800	242000
total—coastal and overseas	216200	158300	374500

Of the total tonnage, 132,500 GRT are required for the coastal trade and the remaining 242,000 GRT for the overseas trade. A major part

mahal (203 miles) with pusher tugs and steel barges. These services are of an experimental character. The Board has also been conducting *topographical and hydrographical surveys for collecting data* for the projects to be started in future. During the Second Plan period, Government agreed to give river conservancy grants to the Joint Steamer Companies and also to advance them a loan of Rs. 2 crores to enable them to replace their fleet. These companies carry the bulk of the water borne traffic between Assam and the rest of India. The other important projects undertaken in the Second Five Year Plan were in the southern region. In Kerala, a project to extend the West Coast Canal from Badagara to Mahe was taken up and the State Government set up a corporation in April, 1958, to take over from the private operators the passenger motor boats plying between Quilon and Ernakulam—a distance of about 90 miles. Provision was made for experimental dredging of the Buckingham Canal in Andhra Pradesh and Madras.

49. The programme at the Centre in the Third Plan provides for loan assistance to the Joint Steamer Companies already agreed to and for the completion of an inland port at Pandu and of the navigational works in the DVC canal already undertaken in the Second Five Year Plan. Important among new schemes included in the programme are (i) a pilot towing project to be undertaken by the Ganga Brahmaputra Board in Sunderbans, (ii) setting up of a central organisation to advise on matters relating to inland water transport, (iii) purchase of dredgers and launches for Sunderbans and Brahmaputra, (iv) improvement of the foreshores at Gauhati, and (v) training establishments. In the State sector, substantial provisions have been made, among other schemes, for the improvement and extension of the West Coast Canal in Kerala, the improvement of Taldanda and Kendrapara Canals in Orissa in connection particularly with export of iron ore through Paradip, and for the development of navigational facilities in the Rajasthan Canal.

SHIPPING

50. A substantial addition has been made in the shipping tonnage during the first two Plan periods and despite foreign exchange difficulties, the overall target of 9 lakh GRT set for the end of the Second Plan is likely to be fully achieved. Indian ships are estimated at present to carry 8 to 9 per cent of India's overseas trade. The following figures indicate the tonnage position for the coastal and the overseas trades at the end of the First and the Second Plan periods:

Table 9: Shipping tonnage at the end of the First and Second Plans

(lakh GRT)

	1950-51	1955-56	1960-61
coastal	2·17	2·40	2·92
overseas	1·74	2·40	6·13
total	3·91	4·80	9·05

ports and the total traffic handled by them in 1960-61 is estimated at about 33 million tons.

55. The programme in the Third Five Year Plan provides mainly for the completion of the projects which are already underway and except for Bombay port, where provision is made for the modernisation and expansion of the docks, no major scheme has been included which may be expected to make any large-scale addition to the capacity of the existing ports. The main objective underlying the schemes in respect of the existing major ports is to maintain and improve the facilities already available. It is expected that with the completion of the schemes, most of which have already been commenced in the Second Plan, the capacity of the major ports will be 49 million tons. This will be sufficient to handle the quantum of traffic expected by the end of the Third Plan period.

56. Two important schemes have been included in the programme with a view to the maintenance and preservation of Calcutta Port. These are: (a) the construction of an ancillary port at Haldia, and (b) the construction of a barrage on the river Ganga at Farakka. The port at Haldia will be supplementary to the port of Calcutta and will be located about 56 miles downstream from it. It is proposed to provide facilities at the port for handling bulk cargo such as coal, iron ore and foodgrains, and also for lightening of general cargo vessels. The general cargo will continue to be handled at Calcutta. The necessary technical investigations are now being conducted in order to finalise the details of the project. The cost of construction of the port, including a dock system with four berths, is estimated to be roughly of the order of Rs. 25 crores. A provision of Rs. 7 crores has been made for the project in the Third Five Year Plan and a substantial part of the work on it is expected to be carried forward to the Fourth Plan period. The port is proposed to be connected by a direct rail link to the main line from Calcutta to Kharagpur.

57. As regards the barrage on the Ganga, this is considered vital for the improvement of the draft conditions in the river Hooghly and for the preservation of the Calcutta port. Owing to lack of sufficient head-water supply to flush the silt, there has been a steady and progressive deterioration in the regime of the Hooghly. Apart from its adverse effects on the navigability of the river, the gradual choking of the channel has led, on the one hand, to an increase in the frequency of the bore tides in the Hooghly and, on the other, to a steady rise in the salinity of its waters. Intensive dredging operations which were found to be necessary to keep the port of Calcutta open for navigation have proved inadequate. The construction of a barrage across the Ganga at Farakka will

of the programme for coastal shipping relates to the replacement of over-aged ships. Of the total of 32,500 GRT proposed to be added to the coastal tonnage, 25,000 GRT will consist of small coastal ships for general cargo service, and the remaining 7500 GRT are accounted for by one coastal tanker. As regards overseas trade, provision is made for the replacement of 95,600 GRT of overaged ships and for the addition of about 148,000 GRT to the existing tonnage. Of the additional tonnage, 55,000 GRT are accounted for by tankers. It is proposed to acquire three tankers, two for import of crude petroleum and one for import of petroleum products.

53. It is recognised that the expansion of shipping has a high priority because it will enable savings to be effected in the foreign exchange expenditure which is at present being incurred on the carriage of the country's overseas trade. The National Shipping Board had recommended a target of 14·2 lakh GRT to be reached by 1965-66. The development programme for shipping, however, depends largely on the availability of foreign aid for this purpose, and of necessity has to be modest. As regards coastal shipping, the Committee on Transport Policy and Coordination is expected, in its final report, to make recommendations on the future role of coastal shipping vis-a-vis the railways. Attempts are meanwhile being made to use the available tonnage to the maximum extent for carrying bulk commodities, particularly coal, with a view to affording relief to the railways.

PORTS AND HARBOURS

54. *Major ports*.--The principal objectives of the development programmes for major ports in the First Plan were to rehabilitate and modernise the facilities at the existing ports, especially those which had suffered heavy wear and tear during the war, and to provide a major port at Kandla to handle the traffic which was previously catered for by Karachi. Due to delays in the finalisation of the details of the programme, the progress during the First Plan was slow. The capacity of major ports increased during the period from 20 million tons to 25 million tons. The traffic handled in the last year of the Plan was 24 million tons. The Second Plan aimed at the completion of the projects commenced during the First Plan and the provision of additional berthing capacity at the ports of Calcutta, Madras, Vishakhapatnam and Cochin. In the first two years of the Plan, there was severe congestion at the ports on account of large-scale imports of heavy cargo, and several measures were taken to increase the capacity of major ports and to enable them to handle the increased traffic. Due to the deteriorating draft conditions in the river Hooghly, special programmes were taken up at the Calcutta port providing for expensive river training works and the dredging of the difficult bars. There has been a substantial increase in the capacity of the major

59. The programme for the development of ports includes two projects for the upgrading of two minor ports into all-weather ports, viz., Tuticorin and Mangalore. The development of an all-weather alongside port at Tuticorin is considered necessary in order to enable the port to handle the existing traffic efficiently and to provide capacity for increases in traffic. The exact scope of the project will depend upon the volume of traffic which the port is expected to handle in future. A substantial part of the present traffic consists of commodities which enter into the coastal trade and about this it will be possible to take a long-run view only after the report of the Committee on Transport Policy and Coordination is available.

Mangalore is proposed to be developed primarily to handle about 2 million tons of iron ore expected to be exported from Chitaldrug and other mining areas in the vicinity of the port. Technical investigations in connection with the development of the port are in progress.

60. The cost of the port development programmes is estimated to be of the order of Rs. 115 crores. This includes Rs. 80 crores for the programmes of the major ports, Rs. 25 crores for the barrage at Farakka and Rs. 10 crores for the development of new major ports at Mangalore and Tuticorin.

61. *Minor ports.*—The minor ports of India, which exceed 150 in number, are estimated to handle about 6 million tons of traffic every year. Schemes costing about Rs. 2·4 crores for minor ports were included in the First Five Year Plan, but the actual expenditure did not exceed Rs. 1·5 crores. The provision for minor ports in the Second Five Year Plan was Rs. 5 crores and is estimated to have been almost fully utilised. The programme included in the Third Five Year Plan is estimated to cost Rs. 15 crores.

62. The Intermediate Ports Development Committee (1960), after a detailed survey of the more important of the minor ports, known as the 'intermediate ports', has recommended development schemes for the next five to ten years. The programme in the Third Five Year Plan has been formulated on the basis of the recommendations of the Committee. Of the more important schemes included in the programme, mention may be made of the proposal to develop an intermediate port at Paradip to handle about 5 lakh tons of iron ore from the Sukinda-Daitari areas. Provision is also being made for the development of the transport facilities needed to move iron ore from the mining areas to the port. Neendakara (Kerala) is also proposed to be developed as an intermediate port and a deep draft berth is to be provided at Karwar, if after investigations this is found technically feasible, in order to handle export of iron

improve the headwater supply in the Hooghly and will provide a lasting solution to the problem. The other incidental benefits from the barrage will be improvement of the water supply in Calcutta and peripheral industrial towns, the improvement in communications between north and south Bengal and the reduction in the length of the inland water transport route between Assam and West Bengal. The total cost of the project is estimated at Rs. 56 crores and the outlay required in the Third Five Year Plan, on the basis of a nine-year programme for completion of the project, is estimated at Rs. 25 crores.

58. At Calcutta, in addition to the supplementary port at Haldia and the barrage at Farakka, provision has been made for training works for improving the Balari Channel and for more dredgers and other floating equipment. These schemes are estimated to cost Rs. 28 crores.

The programme for the Bombay port includes schemes costing about Rs. 26 crores. The more important among these are: dock modernisation scheme, dredging of the main harbour channel, expansion of the Ballard Pier and construction of a passenger terminal building at the Pier, electrification of cranes in the Alexandra Docks and a labour housing scheme. The dock modernisation scheme is intended to provide additional deep draft berths in the port which are considered necessary in view of the great increase in the number of larger vessels visiting the port in recent years. The schemes pertaining to Ballard Pier are considered essential to meet the requirements of passenger traffic at the port. The passenger terminal building needs to be replaced immediately because the foundations of the existing building are rapidly deteriorating.

The programme for the Madras port is estimated to cost about Rs. 7 crores and apart from the completion of the projects which are already under way, provides for additional ore and coal yards and mechanical equipment for handling iron ore.

The programme for Vishakhapatnam estimated to cost Rs. 9 crores provides for the completion of the additional four-berth scheme, and the ore loading installations at the port, the work on which was started in the Second Five Year Plan. The scheme is intended to enable the port to handle an additional 2 million tons per annum of iron ore from 1964 onwards for export to Japan and further additional 4 million tons per annum from 1966 onwards.

For Kandla provision is made for the completion of two additional berths, procurement of a dredger, expansion of the township and schemes for augmenting the water supply at the port.

The provision for Cochin is intended mainly for the completion of schemes carried forward from the Second Plan.

in the Second Plan. Four more aerodromes are well advanced towards completion. In the Third Plan, it is proposed to spend about Rs. 25.5 crores on civil aviation which is distributed between various categories of schemes as shown in the Table below. The Table also shows the expenditure incurred on these schemes under the First and the Second Five Year Plans.

Table 11: Expenditure in the first two Plans and provision in the Third Plan for Civil Aviation

(Rs. lakhs)

schemes	First Plan actual	Second Plan estimated	Third Plan provision
works at aerodromes	612	1290	1850
aeronautical telecommunication equipment	68	229	500
air routes and aerodromes	29	43	100
training and education equipment	10	23	84
research and development equipment	5	6	16
total	724	1591	2550

65. Extensive development works were undertaken in the Second Five Year Plan at Bombay (Santa Cruz), Calcutta (Dum Dum) and Delhi (Palam) airports. These works which were undertaken primarily to facilitate the flights of jet aircraft will be completed during the Third Plan period. Priority will be given in the Third Five Year Plan to the programmes for extension of the existing runways, wherever necessary, including the development of an air field at Madras for jet operations on the Malaya—Indonesia—Australia route, and for strengthening and extending the runways at Lucknow, Gaya and Ahmedabad aerodromes which are alternates for the international airports. Provision is made in addition for construction of taxi tracks, aprons, terminal and other technical buildings, etc. The programme also provides for permanent ground lighting facilities at a number of aerodromes. A sum of Rs. 65 lakhs, out of the total provision for works at aerodromes, has been set apart for the construction of new aerodromes, new airstrips for Flying and Gliding Clubs and for airstrips at places of tourist importance. In addition, about Rs. 20 lakhs have been provided in the programme for the development of tourism for construction of aerodromes and airstrips to develop tourist traffic. The provision for civil aviation also includes a provision of Rs. 2 crores for undertaking, if necessary, the construction of an entirely new airport at Delhi. The total cost of this project is estimated to be of the order of Rs. 12 crores.

66. The programme in respect of aeronautical telecommunication services includes schemes for improved types of navigational aids at selected

ore. Other schemes included in the programme are extension of groynes and acquisition of a dredger at Kakinada, stabilisation of the channel at Masulipatam, provision of groynes and a pier at Cuddalore, raising and widening the low level jetty at Ratnagiri, construction of a wharf at Redi, improvement of the lock gate at Bhavnagar, development of additional lighterage capacity at Porbandar and development of an oil tanker berth at Okha. In the Central sector, provision has been made for a survey-cum-dredger pool. Arrangements have already been made to acquire two dredgers and six survey launches under this programme. One more dredger will be added to the pool in the Third Five Year Plan.

The capacity of all the minor ports is estimated to increase to about 9 million tons on completion of the schemes included in the Third Plan.

LIGHTHOUSES

63. Of the provision of Rs. 6 crores made for the development of lighthouses and lightships, a sum of Rs. 2·4 crores will be required for completion of the works carried forward from the Second Plan and the remaining Rs. 3·6 crores will be available for new works. During the Second Plan period, it has been possible to establish 72 new lighthouses and other aids to navigation including radio beacons, very high frequency radio transmission sets and lighted and unlighted buoys. Work on the construction and improvement of 50 lighthouses and other aids to navigation like radars, radio beacons, fog signals and lightbuoys is in progress. In addition work is proceeding in connection with the establishment of two decca navigator chains and the lighthouse workshop and laboratory at Calcutta. Among the new schemes included in the Third Plan is one for a lighthouse tender estimated to cost Rs. 140 lakhs.

CIVIL AIR TRANSPORT

64. *Civil aviation.*—Civil aviation has made rapid progress since partition. Between 1947 and the commencement of the First Plan, about Rs. 6·6 crores were spent on works relating to civil aviation. During the period of the first two Plans the expenditure incurred amounted to about Rs. 24 crores. The programme in the First Plan aimed mainly at making good the deficiencies in aerodromes, communication facilities, equipment, etc. The Second Plan provided for the development of facilities to meet the growing needs of domestic and international traffic and in particular the new demands which had arisen from recent technical advances and from India's obligations under the Convention on International Civil Aviation to provide facilities at aerodromes in conformity with the standards laid down by the Convention. The Civil Aviation Department at present maintains 85 aerodromes of which four were added

69. The Indian Airlines Corporation had a fleet of 92 aircraft at the beginning of the Second Five Year Plan consisting of 66 Dakotas, 12 Vikings, 6 Skymasters and 8 Herons. The Corporation purchased 10 Viscounts during the Second Plan which added considerably to its capacity. The entire fleet of Vikings and Herons was, however, withdrawn from service during the period. The Corporation also ordered during the Second Plan period 5 Fokker Friendship aircraft for replacement of Dakotas. The operating fleet of the Corporation at the end of 1960-61 consisted of 54 Dakotas, 5 Skymasters and 10 Viscounts. There has been one very welcome development during the Second Plan period—the introduction of the Viscount aircraft has led to a substantial increase in the revenue and a decrease in the unit cost of operation as a result of which during the year 1959-60 the Corporation has been able to break-even for the first time. The programme in the Third Five Year Plan provides for the purchase of four Viscounts and of 25 modern aircraft to replace Dakotas. It is proposed to retain about ten Dakotas in service at the end of the Third Five Year Plan; these will be utilised for freight services. A total provision of Rs. 15 crores has been made in the Third Plan for the Corporation, of which Rs. 10 crores are estimated to be required for the purchase of medium-sized aircraft for replacement of Dakotas and Rs. 1 crore for 4 additional second hand Viscounts. A sum of Rs. 2·8 crores has been provided for construction of staff quarters at the headquarters office and other buildings required by the Corporation. The remaining amount of Rs. 1:5 crores is required for purchase of workshop equipment, vehicles and for training facilities for the crew for new types of aircraft.

TOURISM

70. Tourism has assumed increasing importance during recent years. The number of foreign tourists visiting India is estimated to have increased about six times over the last decade—from about 20,000 in 1951 to 123,000 in 1960. The earnings of foreign exchange from tourism are estimated to have increased from about Rs 4 crores in 1950 to about Rs. 20 crores in 1960. The programme for the development of tourism included in the Second Five Year Plan aimed mainly at providing accommodation, transport and recreational facilities at important tourist centres. Provision was also made for the construction of road links to these centres. Considerable time was taken in finalising the schemes in the Second Five Year Plan. They were mostly in the nature of building projects and the progress had been rather slow except in Jammu and Kashmir where most of the provision of about Rs. 1 crore had been utilised.

71. In the Third Plan about Rs. 8 crores are provided for the development of tourism. Slightly less than one half of this amount will be available for schemes to be taken up by the Central Department of

aerodromes so as to provide all-weather aid to fast moving high altitude aircraft; and for strengthening the facilities for terminal control communications and dissemination of meteorological information. The training programme provides for the purchase of aircraft and other equipment for the training centre at Allahabad, and for the establishment of 15 new flying clubs as against 5 clubs added during the Second Plan period.

67. *Air corporations.*—There has been a rapid expansion of the activities of the air corporations since they were constituted in 1953. The figures in the following Table indicate the increase in their capacity and in the volume of traffic carried by them during the period from 1953-54 to 1959-60.

Table 12: Traffic carried by air corporations during 1953-54 and 1959-60

(millions)

item	1953-54	1959-60
Indian Airlines Corporation		
available capacity in ton miles	45·84	67·87
revenue ton miles performed	31·22	47·99
passengers carried	0·43	0·70
Air India International		
available ton miles	16·91	59·52
revenue ton miles performed	10.47	34·62
passengers carried	0·03	0·09

The capacity offered by the Air India Interntaional is estimated to have increased further to about 103·2 million ton miles in 1960-61.

68. Air India International started with a fleet of four Constellations. Five Super-Constellations were purchased in the First Plan, and five more in the Second Plan but one was lost in an accident in 1959. The Corporation also purchased three Boeing 707 jet aircraft during the Second Plan and ordered one more Boeing to be delivered early in the Third Plan period. The operating fleet of the Corporation at present consists of three Boeings and nine Super-Constellations. The programme in the Third Plan provides for the purchase of four additional jet aircraft of which two have already been ordered by the Corporation. The total provision made for the Corporation in the Plan is Rs. 14·5 crores, of which Rs. 13·5 crores will be required for the purchase of aircraft. The remaining Rs. 1 crore is intended for expansion of workshops and hangars, purchase of equipment, etc. It is proposed to establish a jet engine overhaul base at Bombay early in Third Plan period.

POSTS AND TELEGRAPHS

73. The cost of the programmes of the Posts and Telegraphs Department included in the Third Five Year Plan is estimated at Rs. 77·6 crores. This has the following break up:

Table 14: Cost of the programme of the Posts and Telegraphs Department in the Third Plan

(Rs. crores)

schemes	estimated cost
telephone services	
local telephones	35·0
trunk telephones	6·0
trunk cables	8·6
telegraph services	2·0
demands of other administrations	2·0
buildings	11·0
miscellaneous	2·0
telecommunication facilities for railway electrification	11·0
total	77·6

74. *Telephone services.*—The number of telephones in the country increased from 168,000 in 1950-51 to 280,000 in 1955-56 and further to 460,000 in 1960-61. Thus, as against about 112,000 telephones added during the First Plan, the addition during the Second Plan period comes to 180,000. The programme in the Third Five Year Plan provides for about 200,000 new direct telephone connections and in addition for conversion of 50,000 manual lines into auto lines. Automatic exchanges will be installed in about 45 towns and the existing auto exchanges in 32 towns will be expanded. A large number of the additional telephone connections proposed to be provided are six digit telephones which will require installation of additional exchange equipment.

The programme for trunk telephones provides for the installation of ten trunk automatic exchanges and a number of additional manual trunk exchanges and about 2000 public call offices during the Plan period. It is proposed to meet the heavy demand for trunk telephones between important stations by introducing subscriber-to-subscriber dialling service. The programme aims at extension of the trunk network to all the administrative headquarters such as districts, sub-divisions and tehsils. Provision has been made for the completion of the project for laying coaxial cables between Delhi and Calcutta and Delhi and Bombay which was taken up in the Second Five Year Plan. The programme also provides for coaxial cables being laid between Bombay, Madras and Coimbatore and between Bombay and Nagpur and Delhi and Amritsar.

Tourism and for grants to the State Governments and the remaining amount will be spent as part of the State plans. The schemes in the Central sector provide for facilities at centres which are important from the point of view of foreign tourism while those in the State plans are intended mainly for home tourism. As in the Second Plan, the programme in the Third Plan concentrates largely on provision of facilities for accommodation and transport. Provision has been made for winter sports at Gulmarg in Kashmir. The expansion of the hotel industry in the country has not been commensurate with the growing needs of tourism. Measures are under consideration for assisting the industry with loans for the construction of new hotels and improvement or expansion of existing ones.

COMMUNICATIONS

72. The expansion of industrial and commercial activity in the past ten years has led to a growing demand for communication facilities, the growth of which is an integral element in the economic and technological advance of the country. The communication services include postal, telegraph and telephone services, overseas communications and meteorology. Over the period of the first two Plans, the number of postal articles handled in the country increased by about 80 per cent, i.e. from 2270 million to about 4054 million. The number of telegrams increased by about 43 per cent, i.e. from 27·9 million in 1950-51 to 40 million in 1960-61. The number of trunk calls handled by the Telephone Department increased about fivefold, i.e. from about 7·1 million in 1950-51 to about 34 million in 1960-61. These figures will give an indication of the growing demands placed on the Posts and Telegraphs Department as a result of the economic growth of the country. Despite a substantial expansion in their capacity, the posts and telegraphs services as also the other communication services in the country have been working under a measure of strain during recent years. The following Table shows the provision and expenditure in the First and the Second Plans and the cost of the approved programme in the Third Plan for the various departments under the Department of Communications:

Table 13: Outlay on communications

(Rs. crores)

departments	First Plan expenditure	Second Plan provision	Second Plan estimated expenditure	Third Plan cost of approved programmes
posts and telegraphs	39·57	63·00	50·60	77·60
overseas communications	0·58	2·00	0·72	3·00
meteorology	0·47	1·50	0·99	3·00
indian telephone industries	2·91	0·50	0·50	2·80
wireless planning and coordination	..	..	..	0·50
teleprinter factory	..	..	0·09	1·40
total	43·53	67·00	52·90	88·30

namely, Hindustan Teleprinters Ltd. was constituted with Italian collaboration in December, 1960, with an authorised capital of Rs. 3 crores. The factory will start with the production of about 170 teleprinters in 1961. Its capacity will be stepped up gradually, and production is expected to reach the target of over 1000 machines a year by 1963-64. The indigenous content of the machines will also be gradually increased to 100 per cent over a period of four to five years.

Indian Telephone Industries

79. Indian Telephone Industries have been able to achieve a substantial increase in their capacity during the Second Plan period. The production of exchange lines increased from about 30,000 at the commencement of the Second Plan to 78,000 in 1960-61 and that of telephone instruments during the same period from about 50,000 to 120,000. The factory produced, in addition, in 1960-61 about Rs. 64 lakhs worth of transmission equipment. However, having regard to the targets set for the expansion of the telephone system in the country in the Third Plan, the capacity of the factory is considered inadequate particularly in regard to the manufacture of transmission equipment. Indian Telephone Industries have a development programme in the Third Plan estimated to cost Rs. 2·8 crores. This will enable them to produce by the end of the Third Plan period about 100,000 exchange lines and about 160,000 telephone instruments per annum. A substantial expansion in the capacity in respect of transmission equipment is also envisaged to be achieved during the Plan period.

Overseas Communications Service

80. At the commencement of the First Plan, countries with which India was connected by direct radio telegraph, telephone and photo services numbered 7, 2 and 2 respectively. As a result of the expansion programmes undertaken in the first two Plans, the number of countries connected by these services increased to 23, 23 and 9 respectively. The targets for the Third Five Year Plan have been indicated in terms of the number of independent transmission circuits which will be available at each station as follows:

Table 15: Targets for overseas communications service stations in the Third Plan

(numbers)

station	radio transmission circuits		telephone transmission circuits	
	as on 1-9-60	by 31-3-66	as on 1-9-60	by 31-3-66
Bombay	10	12	3	4
Calcutta	7	9	2	3
New Delhi	4	9	1	2
Madras	1	1		1

75. *Telegraph services.*—The number of telegraph offices in the country increased from 3600 in 1950-51 to 5100 in 1955-56 and further to 6450 in 1960-61. The programme for the Third Plan provides for the addition of 2000 telegraph offices during the Plan period. The programme also aims at reducing the time interval between the booking of an ordinary telegram and its delivery at its destination point to the minimum possible. This has necessitated the installation on an extensive scale of modern devices like teleprinters and tape-relay systems to avoid repeated handling of telegrams and the gradual replacement of morse working.

76. *Postal services.*—The number of post offices in the country increased from 36,000 in 1950-51 to 55,000 in 1955-56 and to 77,000 in 1960-61. The increase expected in the Third Five Year Plan is of the order of 17,000. The objective in the First Five Year Plan was to serve, besides all administrative headquarters such as tehsils, talukas and thanas, every group of villages located within a radius of two miles and having a total population of 2000 provided the annual loss involved was not more than Rs. 750 and that there was no post office within a distance of three miles. The conditions for opening post offices in villages were relaxed during the Second Plan period and the programme aimed at providing post offices to each group of villages within a radius of two miles and having a population of 2000. In addition, provision was made to provide post offices at every headquarters of national extension and community project blocks provided it fulfilled the general conditions as to the annual loss and distance from an existing post office. In 1959, the conditions for opening post offices were further liberalised for the headquarters of the community project and the national extension service blocks and for places where there were schools run by district boards, local boards or schools approved by the State Governments. The distance condition for opening post offices at all such places was reduced from three miles to two miles. Further liberalisation of the conditions for opening up new post offices will be considered, if necessary, during the period of the Third Plan.

77. *Other schemes.*—The programme of the Posts and Telegraphs Department also provides for expansion of the workshops at Calcutta and Jabalpur and for the shifting of the Bombay workshop to a new site. Provision has also been made for the construction of 5000 staff quarters and for office buildings required by the Department during the Plan period.

The Department is required to provide telecommunication facilities in connection with the railway electrification programme. The cost of these facilities is estimated at Rs. 11 crores.

TELEPRINTER FACTORY

78. A provision of Rs. 1·4 crores has been made in the Third Plan for a factory for the manufacture of teleprinters. A separate company

national Convention and Regulations on Telecommunications. The provision in the Third Plan is intended for the establishment of new monitoring stations, extension of existing monitoring stations and purchase of equipment for them.

BROADCASTING

84. In the field of broadcasting considerable progress has been made during the last ten years. In the First Five Year Plan, each language area was provided with at least one transmitting station bringing the total number of stations to 26 which was further raised to 28 by the end of the Second Plan. The main objective of the development programme in the Second Five Year Plan was to extend the available services to as wide an area as possible largely through internal short-wave transmitters and to strengthen the external broadcast services. The objective in the Third Five Year Plan is to make the internal coverage more effective by expanding the medium wave broadcast services and by strengthening the arrangements for pre-recording of programmes. The programme in the Third Plan also includes provision for further improvement of the external broadcast services.

85. The development programme for broadcasting included in the Third Five Year Plan is estimated to cost about Rs. 11 crores. The various schemes included in the programme are indicated below:

Table 16: The break-up of the broadcasting programme in the Third Plan

(Rs. lakhs)

schemes	provision
carry-forward schemes from the Second Plan (including spillover of the medium wave programme)	442·0
extension of medium wave services	148·0
provision of recording and playback equipment	91·5
replacement of assets	40·5
television centre, Bombay	40·0
community listening scheme	40·0
other schemes, including staff quarters, research etc. . . .	94·0
external broadcast services	200·0
total	1096·0

At the time of the formulation of these proposals, the highest priority was given to the programme for the expansion of internal broadcast services. This assumed great urgency in view of international agreements. The expansion scheme was, therefore, initiated during the Second Plan period and is proposed to be completed during the Third Plan period. Under this scheme, 55 medium wave and 2 short wave transmitters will be installed at various centres all over the country. The object is.

Provision is made for the introduction on an increasing scale of modern automatic error detection devices and for the development of leased channels and telex services for achieving speed and efficiency of service. The programmes relating to overseas communications services have a priority, in view of the growing needs for international communications and the considerable saving in foreign exchange expenditure expected to be realised from the expansion of the service.

METEOROLOGY

81. The India Meteorological Department provides weather services to a large variety of interests including civil and military aviation, mercantile and naval shipping, communication services, agriculture and public health services, etc. During the Second Plan, the activities of the Kodaikanal Observatory in solar, stellar and radio-astronomical work were expanded. The Seismological Observatory at Delhi was shifted to a new building and equipped with a number of seismographs of up-to-date type. A seismological observatory was also established at Port Blair. Among the other schemes undertaken during the Second Plan period mention may be made of the establishment of two field magnetic observatories at Trivandrum and Annamalainagar, modernisation and development of radio meteorology, climatology and agricultural meteorology.

82. In the Third Plan further progress will be made with the modernisation of equipment at important observatories. It is proposed to improve the network of rawin radio-sonde stations by starting 18 additional stations with modern electronic equipment in order to provide upper air data for issue of forecasts for high level jet aircraft flights over the country. More aerodromes will be equipped with storm detection radars. It is proposed to start a Northern Hemispheric Collection and Analysis Centre at New Delhi to collect, study, and disseminate meteorology data for the northern hemisphere. A training centre for the training of staff in radio meteorology will also be established at New Delhi. An institute of Tropical Meteorology will be established at Poona for advanced research and training in tropical meteorology. A provision of Rs. 2 crores has been made for capital equipment required by the Department and Rs. 1 crore for the construction works.

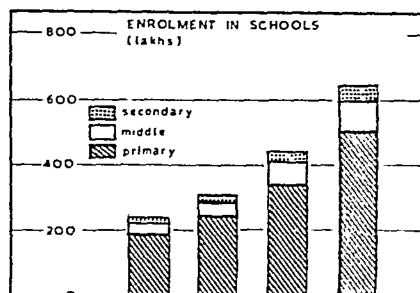
WIRELESS PLANNING AND COORDINATION

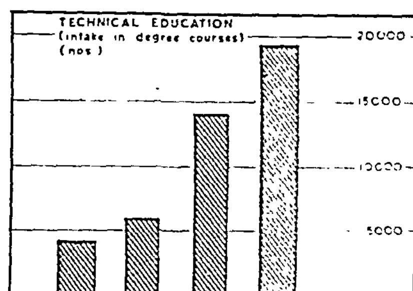
83. Wireless Planning and Coordination has two main functions to perform. The first is the work of "Frequency Management", i.e., conserving the frequencies already available for the wireless services of this country and finding out fresh and vacant positions in the wireless spectrum which could be made available to India's rapidly developing wireless activities. The second primary function is related to the administration and enforcement of the Indian Wireless Telegraphy Act and of the Inter-

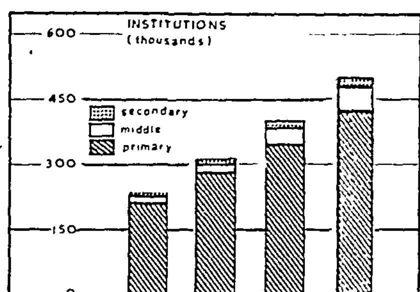
EDUCATION: FIRST AND SECOND PLAN ACHIEVEMENTS

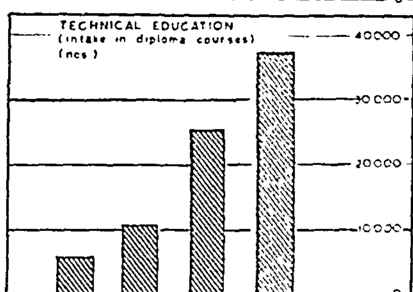
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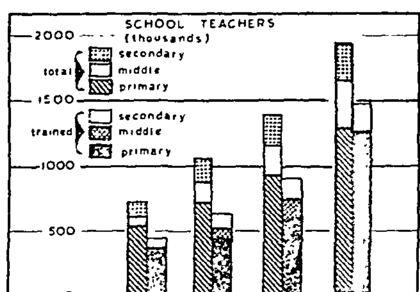
THIRD PLAN TARGETS

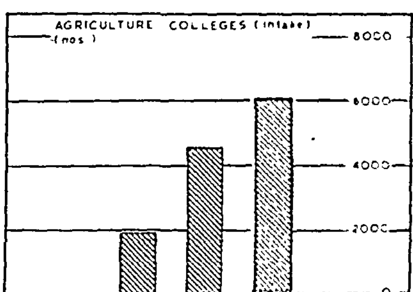


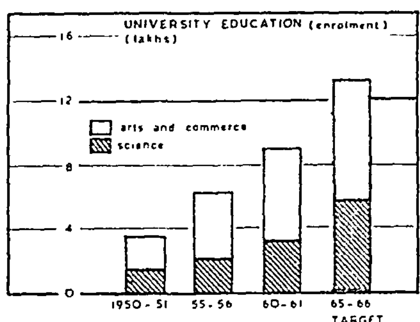


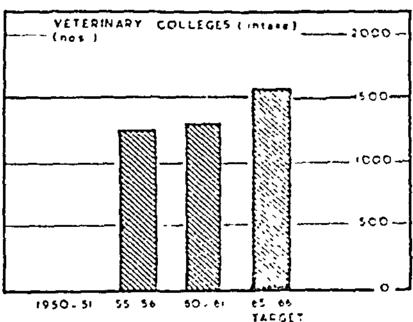












mainly to extend the coverage of the existing network of stations to hitherto uncovered regions as also to provide an alternate channel of light music programmes for urban listeners. In consequence, the medium wave internal services which now cover 37 per cent of the total area and 55 per cent of the population will get extended to include 61 per cent of the area and 74 per cent of the population of the country.

Except at a few locations, no new studio or programme originating facilities are envisaged but the programmes from the existing stations will be pre-recorded on tape and re-broadcast over the new transmitters which will be in the nature of satellite or auxiliary centres. The proposals, therefore, include a comprehensive scheme for supply and installation of the necessary tape recording, playback and duplicating equipment at all the centres.

86. While the main features of the development programme of the All India Radio will thus consist of the medium wave expansion plan and associated tape-recording scheme, the programme also includes provision for certain other schemes, such as expansion of facilities for community listening in the villages, a television centre at Bombay (in addition to the small education television unit at Delhi), engineering research and improvement in the external services, etc. Within the provision for community listening in the programme of All India Radio, it is expected to provide about 32,000 new sets during the period of the Third Plan. These will be supplemented by the sets provided under the community development programme. Steps are being taken to coordinate the community listening programme of the All India Radio with that of the Ministry of Community Development.

The programme for external broadcasting services is estimated to cost Rs. 2 crores and provides for installation of five additional short wave transmitters for strengthening these services.

CHAPTER XXIX

EDUCATION

Education and National Development

EDUCATION is the most important single factor in achieving rapid economic development and technological progress and in creating a social order founded on the values of freedom, social justice and equal opportunity. Programmes of education lie at the base of the effort to forge the bonds of common citizenship, to harness the energies of the people, and to develop the natural and human resources of every part of the country. Developments of the past decade have created a momentum for economic growth; yet, there are large deficiencies in the sphere of education, which must be removed speedily if progress is to be sustained and enduring. It is one of the major aims of the Third Plan to expand and intensify the educational effort and to bring every home within its fold, so that from now on, in all branches of national life, education becomes the focal point of planned development.

2. In the field of general education, as distinguished from technical education, the main emphasis in the Third Plan will be on the provision of facilities for the education of all children in the age group 6—11, extension and improvement of the teaching of science at the secondary and university stages, development of vocational and technical education at all levels, expansion and improvement of facilities for the training of teachers for each stage of education, and increase in scholarships, free-ships and other assistance. There will be special concentration on the education of girls, and the existing disparities in levels of development in education between boys and girls will be substantially reduced. All elementary schools will be oriented to the basic pattern. Reorganisation of university education along the lines of the three-year degree course will be completed, and facilities for post-graduate studies and research work will be further expanded and improved. At all stages of education, the aim must be to develop both skill and knowledge and a creative outlook, a feeling of national unity which stands above region, caste and language, and an understanding of common interests and obligations.

Achievements and Targets

3. Over the decade 1951-61, the number of students increased from 23·5 million to 43·5 million. The increase in the number of pupils in the age-group 6—11 was 79 per cent, in the age-group 11—14, 102 per cent,

entire population in the age-group 6—11, this trend will be corrected to a considerable extent in the course of the Third Plan. The Plan envisages increase in the number of primary schools by 73,000, of middle schools by 18,100 and of high schools by 5200. The total number of schools in the country will go up by about 24 per cent to about 494,500. The following Table shows the progress realised in setting up new schools during the first two Plans and the programme for the Third Plan:

Table 2: Number of schools

item	1950-51	1955-56	1960-61 (likely achievement)	1965-66 (targets)
primary schools (including junior basic)	209671	278135	342000	415000
junior basic schools . . .	33379	42971	100000	153000
middle schools (including senior basic)	13596	21730	39600	57700
senior basic schools . . .	351	4842	11940	16700
high and higher secondary schools .	7288	10838	16600	21800
higher secondary schools . .	47	503	3121	6390
multipurpose schools . .	..	255	2115	2446
secondary schools with elective science	..	..	4625	9579

5. The proportion of trained teachers has increased during the period 1951—61 from 59 to 65 per cent in primary schools, from 53 to 65 per cent in middle schools, and from 54 to 68 per cent in high schools. These figures suggest that progress in providing trained teachers has not been on an adequate scale. As a result of the more intensive programmes proposed for the Third Plan, the proportion of trained teachers in each category is expected to rise to about 75 per cent. Increase in the number of training institutions and in the number of trained teachers may be seen from the Table below:

Table 3: Trained teachers and training institutions

item	1950-51	1955-56	1960-61 (likely achievement)	1965-66 (targets)
training institutions :				
training schools . . .	782	930	1307	1424
training colleges . .	53	107	236	312
teachers :				
primary schools				
teachers	537918	691249	910000	1266000
trained teachers . . .	316124	423192	591500	949500
percentage of trained teachers	58·8	61·2	65·0	75·0
middle schools				
teachers	85496	148394	230000	360000
trained teachers . . .	45569	86810	149500	270000
percentage of trained teachers .	53·3	58·5	65·0	75·0
high/higher secondary schools				
teachers.	126504	189794	229000	290000
trained teachers . . .	68059	113307	155720	217500
percentage of trained teachers .	53·8	59·7	68·0	75·0

and in the age-group 14—17, 139 per cent. The proportion of children in these groups attending schools rose respectively from 43 to 61 per cent, 13 to 23 per cent and 5 to 12 per cent. In the course of the Third Plan, the total number of pupils at school is expected to increase by 20·4 million, 15·3 million in the age-group 6—11, 3·5 million in the age-group 11—14 and 1·6 million in the age-group 14—17. The Table below shows the progress during the first two Plans and the likely increase in the Third Plan:

Table 1: Number of students at school

(lakhs)

stage and age-group	1950-51	1955-56	1960-61 (likely achievement)	1965-66 (targets)
primary (6—11)				
enrolment	191·5	251·7	343·4	496·4
percentage of the age-group	42·6	52·9	61·1	76·4
middle (11—14)				
enrolment	31·2	42·9	62·9	97·5
percentage of the age-group	12·7	16·5	22·8	28·6
secondary (14—17)				
enrolment	12·2	18·8	29·1	45·6
percentage of the age-group	5·3	7·8	11·5	15·6
total (6—17)				
enrolment	234·9	313·4	435·4	639·5
percentage of the age-group	25·4	32·1	39·9	50·1

4. During the first two Plans, the number of schools increased by 73 per cent from 230,555 to 398,200, increase in the number of primary schools being 63 per cent, in middle schools 191 per cent, and in high schools 128 per cent. Progress in basic education at the elementary level is reflected in the increase in the proportion of junior basic schools and senior basic schools from 16 per cent to 29 per cent and from 3 per cent to 30 per cent respectively. Reorganisation of secondary education has mainly taken the form of conversion of high schools into higher secondary schools, establishment of multipurpose schools providing for a variety of courses, and expansion of teaching facilities both for general science and science as an elective subject. The All-India Educational Survey, which was undertaken during 1957—59, revealed important gaps in the distribution of educational institutions. Thus, for the country as a whole, in 1957, about 29 per cent of rural habitations and about 17 per cent of the rural population were not served by any school. In some States these proportions were very much higher.

Progress in establishing new schools during the first two Plans was relatively greater in respect of middle and high schools than in the case of primary schools. With the provision of educational facilities for the

Table 5: Distribution of outlay

sub-head	amount (Rs. crores)			percentage		
	First Plan	Second Plan	Third Plan	First Plan	Second Plan	Third Plan
elementary education .	85	87	209	63·9	41·9	50·0
secondary education .	20	48	88	15·1	23·1	21·1
university education .	14	45	82	10·5	21·6	19·6
other programmes :						
social education	14	4	6	10·5	1·9	1·4
physical education and youth welfare .		10	12		4·8	2·9
others . .		10	11	..	4·8	2·6
total . .	133	204	408	100·0	98·1	97·6
cultural programmes .	*	4	10	..	1·9	2·4
grand total .	133	208	418	100·0	100·0	100·0

In addition to provisions under the head 'Education', resources to the extent of Rs. 37 crores are expected to be available under the community development programme and of about Rs. 42 crores under the programme for the welfare of backward classes, thus bringing the total provision for general education in the Third Plan to Rs. 497 crores, as against Rs. 250 crores during the Second Plan.

8. Provisions in each Plan for education, as in other fields, are in addition to resources provided for 'maintaining' institutions established upto the end of the preceding Plan, as well as to contributions from non-goverment sources. It is estimated that over the Third Plan period 'maintenance' of educational institutions will involve a total expenditure of about Rs. 700 crores as against Rs. 375 crores in the Second Plan. The contribution from non-government sources is difficult to estimate precisely. Over the past decade this contribution has increased from about Rs. 50 crores to about Rs. 90 crores per year. In the course of the Third Plan, on account of the transfer of responsibility for elementary education to panchayats and panchayat samitis and greater effort on the part of corporations and municipalities, this contribution is likely to increase to about Rs. 120–130 crores per annum.

PRE-SCHOOL EDUCATION

9. The need for expanding facilities for pre-school education is being increasingly stressed. In the past progress in this direction has depended mainly on the work of voluntary organisations and the establishment of a number of balwadis. The number of children enrolled in pre-school

*The outlay on cultural programmes in the First Plan was included under 'other programmes'

It is considered that the targets in respect of trained teachers at present formulated by States should be regarded as provisional and every effort made to improve upon them.

6. There has been a large increase in the number of students in universities and colleges, the total enrolment for arts, science and commerce courses being 360,000 in 1950-51, 634,000 in 1955-56 and about 900,000 in 1960-61. During the Second Plan, for the country as a whole, the proportion of students taking science courses increased from 33 per cent to about 36 per cent. In some States progress was specially marked, but there are others where there are still considerable lags. The Third Plan envisages that of the increase of 400,000 students at the university stage, about 60 per cent should be in respect of science classes, bringing the proportion of students taking science courses to over 42 per cent. Developments in university education in relation to arts, science and commerce during the first two Plans and the proposals for the Third Plan are summarised in the following Table:

Table 4: Enrolment and institutions

(in thousands)

item	1950-51	1955-56	1960-61 (likely achievement)	1965-66 (targets)
university stage, age-group 17—23 :				
enrolment	360	634	900	1300
percentage of age-group	0·9	1·5	1·8	2·4
enrolment in science classes	140	210	323	553
enrolment in science classes as percentage of enrolment	38·1	33·0	35·8	42·5
institutions :				
arts, science and commerce colleges (numbers)	542	772	1050	1400
universities (numbers)	27	32	46	58

OUTLAYS

7. The total outlay on education, including engineering and technological education, was Rs. 153 crores in the First Plan and Rs. 256 crores in the Second Plan. Programmes included in the Third Plan entail a total outlay of Rs. 560 crores. For programmes, other than those relating to engineering and technological education set out in the following Chapter, outlay during the First Plan was Rs. 133 crores, and during the Second Plan Rs. 208 crores, while programmes for the Third Plan involve a total expenditure of Rs. 418 crores including a provision of Rs. 10 crores for cultural programmes.

The Table below shows the distribution of outlay on schemes of general education under the First, Second and Third Plans:

measures needed for promoting the education of girls at the primary, middle and secondary stages and made a series of recommendations. These include the provision of quarters for women teachers, special allowances to women teachers working in rural areas, condensed educational courses for adult women so as to enlarge the supply of women teachers, stipends for women teacher trainees, attendance prizes and scholarships, appointment of school-mothers in co-educational institutions and provision of the necessary amenities. To some extent proposals on these lines have been embodied in the plans of States. It is suggested that the various provisions which have been made in these plans should be reviewed afresh at an early date and, from the second year of the Plan, additional steps should be taken to expand specially those facilities which aim at enlarging the supply of women teachers and attracting them to service in the rural areas.

12. The problem of providing educational facilities in backward areas is in part one of ensuring that the institutions are so located that almost every child can go to a school within easy walking distance from his home. The findings of the Educational Survey, referred to earlier, will assist States in planning and locating of new schools from this aspect . Scattered habitations, such as hilly tracts, present certain obvious difficulties; in these, it will be necessary to provide additional facilities, even though these will be relatively more expensive.

13. Apart from the poverty of parents, the circumstances which lead to wastage are lack of properly qualified and trained teachers, defective curricula and insufficient appreciation of the value of education by parents. Closely allied to 'wastage' is 'stagnation' which occurs in the case of children who continue in the same class for more than a year. Introduction of compulsion, appointment of trained and qualified teachers, improvement in the methods of teaching, greater understanding on the part of parents of the desirability of letting their children remain at school, and the planning of school holidays, so that they coincide with the harvesting and sowing seasons, are among the steps to be taken to reduce the incidence of 'stagnation' and 'wastage'.

14. The programme for extending education to all children in the age-group 6—11 is of such crucial importance that financial considerations as such should not be allowed to come in the way of its successful execution in any State. There may, however, be other limitations which may be more difficult to overcome in a short period; for instance, the measure in which some of the poorer or more backward sections of the population or the more backward areas respond to the drive for education, the time needed to persuade all parents to send their daughters to school, the extent of participation and eagerness on the part of the local community, the ability on the part of education authorities to obtain a

classes rose from 28,000 in 1950-51 to 75,000 in 1955-56, and is now estimated at about 300,000. There are at present about 5000 balwadis; of these about 2500 are assisted by the Central and State Social Welfare Boards. The existing balwadis need to be improved and provided with trained child welfare workers (bal sevikas). The Third Plan provides for setting up of six training centres for bal sevikas. In the programme for education Rs. 3 crores have been allotted for child welfare and allied schemes at the Centre and about Rs. 1 crore in the States in addition to resources available under the community development and social welfare programmes. Schemes for child welfare now being formulated by the Ministry of Education include improvement of existing balwadis, opening of new balwadis, expansion of the training programme for balsevikas and a number of pilot projects for child welfare in which education, health and welfare services will be organised in an integrated manner. Schemes for children, specially the setting up of balwadis, will continue to be an important part of the programmes undertaken for women and children in community development blocks and in welfare extension projects.

Elementary Education

10. The Constitution envisaged the provision of free, universal and compulsory education for children upto the age of 14 years. In view of the magnitude of the task, it was agreed early in the Second Plan that as a first step facilities should be created for the education of all children in the age-group 6—11. This is one of the central aims of the Third Plan, to be followed by extension of education for the entire age-group 11—14 during the Fourth and Fifth Plans. The principal problems in providing facilities for the entire age-group 6—11 in the course of the Third Plan period arise from the following factors:

(a) difficulties of bringing girls to school in sufficient numbers;

(b) extreme backwardness of certain areas and certain sections of the population in the matter of education; and

(c) 'wastage' due to parents taking away children from school as soon as they are able to add to the family income so that more than one-half of the children do not reach class IV, thus failing to gain permanent literacy.

11. A very large gap still exists between the proportion of boys and girls attending school. In 1960-61, about 80.5 per cent of the boys were in school as against about 40·4 per cent of the girls. Among States in which the proportion of girls falls much below the average for the country as a whole, are Rajasthan (15 per cent), Uttar Pradesh (20 per cent), Jammu and Kashmir (21 per cent), Madhya Pradesh (19 per cent). Bihar (27 per cent), Orissa (24 per cent) and Punjab (36 per cent). The National Council for Women's Education carefully considered the special

16. The main problems which arise in the expansion of facilities for children in the age-group 6—11 are found in a more accentuated form in the next age-group 11—14, specially in rural areas.

There are large differences in the extent of development in different States as may be seen in Annexure II to this Chapter. The difficulties of providing schooling facilities for backward areas and for scattered populations are even greater in the case of middle school education than in that of primary education.

In the more backward areas and among the more backward sections of the population, rapid development of middle school education can take place only after the necessary foundations at the primary level have been laid. Accordingly, in the Third Plan, for these areas, it will be necessary to concentrate on the expansion of primary education for these groups.

The question of providing facilities on a part-time basis for training in suitable vocations or by way of continuation classes is at present being studied. It should be possible to organise such courses to an increasing extent at middle schools, basic schools, junior technical schools and other centres. The possibility of organising vocational training on a full-time basis for children in the age-group 11—14 should also be examined.

For expanding facilities for the education of girls, the various recommendations of the National Council for Women's Education should be considered further on the lines suggested earlier for primary education.

17. For practical and administrative reasons, the programme of education for the age-group 6—14 visualised in the Constitution has been divided into two stages, 6—11 and 11—14. If the entire age-group 6—14 is considered together, it will be seen from the table below that over the past ten years the number of children at school has gone up from 22.3 million to 40.6 million, the proportion of the total population in the age-group rising from about 32 to 49 per cent. In the case of boys the proportion has risen from 46 to 65 per cent, and in the case of girls from 18 to 31 per cent.

Table 8: Pupils in the age-group 6—14

year	enrolment in classes I—VIII (lakhs)			percentage of population in age-group 6—14		
	boys	girls	total	boys	girls	total
1950-51	163·6	59·1	222·7	45·9	17·5	32·1
1955-56	209·5	85·1	294·6	54·6	23·5	40.0
1960-61	282·0	124·3	406·3	65·4	30·6	48·5
1965-66	371·2	222·7	593·9	73·0	46.1	59·5

sufficient number of teachers, both men and women, who will indentify themselves with the communities in which they work and, finally, the practical steps taken to provide reasonable conditions and prospects to the vast body of teachers working in primary schools. Taking all these factors into account, it is at present estimated that by the end of the Third Plan about 90 per cent of the boys and about 62 per cent of the girls will be at school, the overall percentage for the age-group 6–11 being 76. As the following table shows, in the course of the Third Plan, about 15·3 million additional children will come into schools, of whom 8·6 million are likely to be girls.

Table 6: Pupils in age-group 6–11

year	enrolment in classes I-V (lakhs)			percentage of population in age-group 6—11		
	boys	girls	total	boys	girls	total
1950-51	137·7	53·8	191·5	59·8	24·6	42·6
1955-56	175·3	76·4	251·7	70·3	32·4	52·9
1960-61	233·8	109·6	343·4	80·5	40·4	61·1
1965-66	301·2	195·2	496·4	90·4	61·6	76·4

Differences in levels of development between States will be narrowed to some extent, but they will still be quite considerable. This may be seen from the targets indicated by different States which are set out in Annexure I to this Chapter.

15. *Middle school education* (11–14 *years*).—During the decade 1951–61, the number of children in the age-group 11–14 doubled, while the number of girls increased nearly threefold. Nevertheless, at the end of the period, as compared to 34 per cent of the boys only about 11 per cent of the girls were at school. The Third Plan envisages almost a doubling of the number of girls at school as against the total increase for the age-group of about 54 per cent. The disparity between boys and girls will, however, be still a marked feature, for, against 40 per cent of the boys at schools from this age-group the proportion of girls is likely to be less than 17 per cent. The table shows the enrolment of boys and girls in classes VI–VIII during the First, Second and Third Plans.

Table 7: Pupils in age-group 11–14

year	enrolment in classes VI-VIII (lakhs)			percentage of population in age-group 11—14		
	boys	girls	total	boys	girls	total
1950-51	25·9	5·3	31·2	20·7	4·5	12·7
1955-56	34·2	8·7	42·9	25·5	6·9	16·5
1960-61	48·2	14·7	62·9	34·3	10·8	22·8
1965-66	70·0	27·5	97·5	39·9	16·5	28·6

In most States the period of training for elementary school teachers is proposed to be extended to two years with a view to ensuring a greater measure of thoroughness both in regard to courses and methods. In a number of training schools extension departments will be established for improving the quality of teaching in schools in the neighbourhood. Towards the end of the Second Plan, 276 new training institutions were set up in preparation for the introduction of universal primary education during the Third Plan. The State schemes provide for equipment, buildings and other facilities for these and other institutions.

A factor limiting the expansion of basic education is that it has been largely confined to rural areas. A number of experimental basic schools are, therefore, proposed to be set up in urban areas, so that the problems of basic schools in urban areas can be clearly identified and solutions found for them in cooperation with training colleges.

COMMUNITY EFFORT

21. Provisions made in the plans of States need to be supplemented by local community effort in programmes such as organisation of enrolment drives, persuading parents to send girls to schools, construction of school buildings, and provision of additional equipment and furniture to schools and of mid-day meals and free clothing for the poorer children. In several States encouraging results have been achieved in the mobilisation of local resources, and it is expected that local support will be forthcoming in even greater measure as Panchayati Raj institutions are established in different States.

Several States have provided in their plans for mid-day meals for children attending schools, notably, Madras, Kerala, Andhra Pradesh, Mysore and Orissa. In Madras, which has the largest programme in this field, one million children are expected to benefit in addition to about a million already being served by the programme. About 40 per cent of the expenditure is being met by the local community. The movement for mid-day meals provides a special opportunity for each urban or rural community not only to participate in the educational effort, but also to improve nutrition and health in the schools and to assist the poorer students. Although the programme is at present somewhat limited on account of financial considerations, it is suggested that State Governments should endeavour to provide for it, at any rate, wherever local communities come forward to take their due share in it.

SECONDARY EDUCATION

22. Development of the economy and the large increase in the number of secondary schools and in the number of students of the age-group 14—17 enrolled in them have altered the character of the demands which

The Third Plan postulates an increase in the number of children in the age-group 6—14 about equal to that achieved during the preceding decade. For girls the proportion in the age-group should go up to about 46 per cent and for boys to about 73 per cent, the overall proportion increasing to nearly 60 per cent. These figures provide a measure of the task that remains to be carried out during the Fourth and Fifth Plans.

BASIC EDUCATION

18. Reorganisation of school education along basic lines has been a key programme since the First Plan. During the Third Plan it is proposed to convert about 57,760 schools into basic schools, to orient the remaining schools to the basic pattern, to remodel all training institutions along basic lines, to establish basic schools in urban areas, and to link up basic education with the development activities of each local community.

19. Progress towards fully developed basic schools will inevitably be spread over a long period, since the number of elementary schools involved is large and the majority of the existing teachers have yet to be trained in the techniques of basic education. By way of preparation for conversion into basic schools, a programme for orienting all existing schools to the basic pattern was initiated during the Second Plan. This aims at the adoption of a common syllabus in all basic and non-basic schools and the introduction of simple crafts and activities like social service, community living, and cultural and recreational programmes, which do not involve much expenditure or require teachers fully trained in basic education. With a view to completing the process of orientation during the earlier phase of the Third Plan, it is proposed that schools should be given simple equipment needed for the purpose and teachers who have not been trained in basic education should be given short orientation courses.

TRAINED TEACHERS FOR BASIC AND OTHER SCHOOLS

20. Perhaps the most important measure for the expansion of basic education is the provision of larger facilities for the training of teachers for basic schools and the reorganisation of existing training centres along basic lines. At the end of the Second Plan, elementary school teachers were being trained in 1307 institutions, of which about 70 per cent were already organised on the basic pattern. By the end of the Third Plan, the number of training institutions will increase to 1424 and all of them will impart training on basic lines, the number of pupil-teachers on rolls being about 200,000 as compared to 135,000 in 1960-61. For teachers who have not been trained in basic education, short-term courses of training in the simpler aspects of basic education are to be provided.

given in the Third Plan to the consolidation and improvement of quality in all aspects of secondary education reorganisation.

24. *Enrolment.*—In the first two Plans the number of secondary schools increased from 7288 in 1950-51 to nearly 16,600 at the end of 1960-61. The number of children enrolled in classes IX to XI increased from about 1·2 million to 2·9 million. Although the number of girls in these classes increased from 200,000 to 520,000 during this period, girls constituted less than one-fifth of the total number attending secondary schools. As the following table shows, at the end of the Second Plan only about 4·2 per cent of girls availed of high school education as compared to about 18·4 per cent of boys of the age-group 14—17. There is thus serious disparity between enrolment in the two groups which, in turn, affects the number of women available for filling such positions as teachers, nurses, village level workers, social workers and others. In the Third Plan the number of girls in schools will be nearly doubled, but their proportion in the age-group as a whole will remain low, being about 7 per cent as compared to about 24 per cent in the case of boys.

Table 9: Pupils in the age-group 14—17

year	enrolment in classes IX—XI (lakhs)			percentage of population in age-group 14—17		
	boys	girls	total	boys	girls	total
1950-51	10·2	2·0	12·2	8·7	1·8	5·3
1955-56	15·8	3·0	18·8	12·8	2·6	7·8
1960-61	23·9	5·2	29·1	18·4	4·2	11·5
1965-66	35·7	9·9	45·6	23·7	6·9	15·6

The Statewise position in regard to the enrolment at this stage is given in Annexure III to this Chapter.

25. *Higher secondary schools.*—One of the principal recommendations of the Secondary Education Commission was that high schools should be upgraded to higher secondary schools so as to make the curriculum more broad-based than in the past and to provide better standard of education by providing an additional year in school. This would make secondary education a terminal point for a large proportion of students who have to enter life directly at the end of the secondary school. During the first two Plans 3121 higher secondary schools were established in different States. This number is expected to rise to 6390 by the end of the Third Plan.

26. *Science education.*—The Second Plan gave high priority to the expansion and improvement of science education at the secondary stage. The Secondary Education Commission had recommended that every

secondary education is called upon to meet. New social groups are seeking education and are coming within its influence. Expansion has brought into secondary schools a larger range of abilities and aptitudes. Secondary schools have to be so reorganised that they provide diversified educational service to pupils according to their needs. In the middle and lower grades of many branches of economic life, in administration, rural development, commerce, industry and the professions, the requirements of trained manpower have to be met after the necessary training, by products of secondary schools.

The programme for the reorganisation and improvement of secondary education, which was taken up following the report of the Secondary Education Commission, has proceeded along several lines and is designed both to enlarge the content of secondary education and to make it a self-contained unit within the educational process. The measures envisaged are the conversion of high schools into higher secondary schools, development of multipurpose schools with provision of a number of elective subjects along with and in addition to the academic course, expansion and improvement of facilities for the teaching of science, provision of educational and vocational guidance, improvement of the examination and evaluation system, enlargement of facilities for vocational education, increased facilities for the education of girls and the backward classes and encouragement to merit through scholarships.

23. Reconstruction along these lines involves a major revision of the secondary school curriculum and the introduction of new techniques and procedures. Subjects such as general science and social studies and the various elective courses are relatively new concepts in the secondary school curriculum and call for a new orientation on the part of the secondary school teacher. In turn, this has necessitated a countrywide programme of in-service teacher education organised by State Education Departments as well as special extension services.

Secondary school teachers have to be thoroughly prepared for handling the new subjects efficiently. The teacher education programme at the pre-service level has also to be reorganised in line with the changes that have taken place at the secondary level. The standard of science education has to be raised to a level which will effectively support the future scientific advance of the nation. Shortcomings which have been observed in the working of the multipurpose schools have to be remedied and the scheme placed on a stable footing. Educational and vocational guidance programmes have to be extended to reach as many schools and pupils as possible. Several other measures have also to be taken to strengthen the entire programme of the secondary school reorganisation, such as improvement in craft teaching, organisation of school libraries, the better use of audio-visual techniques, etc. Special emphasis is, therefore, to be

aptitudes and abilities. The Secondary Education Commission, therefore, recommended the setting up of multipurpose schools, which would offer a number of practical courses along with the academic stream, so as to present the pupil with a variety of courses, out of which he could make his choice according to his special interests. During the first two Plans 2115 multipurpose schools were established. These offer one or more practical courses in Technology, Agriculture, Commerce, Home Science and Fine Arts in addition to humanities and science. Although the concept of the multipurpose school has been readily accepted and the scheme has expanded rapidly, certain difficulties have been encountered, such as the lack of teachers trained to teach the practical subjects, insufficient teaching material, specially text-books and handbooks, limited range of elective courses and inadequacy of educational and vocational guidance facilities. During the Third Plan, therefore, it is proposed to concentrate on the consolidation of the scheme by strengthening the institutions already established, the programme of expansion being limited to about 331 new schools. An integrated teacher training programme for the multipurpose schools is to be undertaken, and for this purpose four regional training colleges will be established which will prepare teachers for the multipurpose schools through in-service and pre-service training programmes both in the practical and the scientific subjects. Steps will also be taken to stimulate greater experimental work in multipurpose schools for providing courses of study suited to different levels of ability, including special programmes of education for gifted students.

28. *Educational and vocational guidance.*—The successful organisation of secondary education requires the provision of a well-planned programme of educational and vocational guidance which will help parents and pupils in selecting the most suitable educational courses and most satisfying vocational pursuits. The lack of such an organised programme of guidance has been one of the handicaps in the working of the multipurpose schools in the past. During the Second Plan, in addition to setting up of a Central Bureau of Educational and Vocational Guidance, State Bureaux of Educational and Vocational Guidance were established in 12 States. These bureaux have been carrying out a programme of training of career masters and counsellors, test construction and guidance services to schools. The guidance movement, however, has not yet made a significant impact on secondary schools. It is, therefore, proposed in the Third Plan to strengthen the State Bureaux in such a manner as to help them to carry the guidance programme farther into the field and also to ensure a minimum programme of career information service in as many secondary schools as possible.

29. *Teaching of crafts.*—The reorganised curriculum of secondary schools includes crafts as one of the core subjects. The problem of securing craft teachers in sufficient numbers and improving the teaching of

secondary school pupil should study general science as a compulsory subject, so that he gains a basic quantum of scientific knowledge as part of his general education. In addition, provision was to be made for science as an elective subject for those students who wished to pursue higher studies. By the end of the Second Plan a programme of general or elementary science has been introduced in almost all secondary schools, while science of an elective standard has been provided in about 4625 schools. However, a considerable proportion of schools lacks the basic minimum requirements in respect of laboratories and equipment and also suitable text-books and handbooks. Teachers have to be prepared in the integrated approach which is required in the teaching of general science. It is also necessary to encourage students in creative and original activity in science. This was sought to be done during the Second Plan by establishing science clubs in selected secondary schools and training colleges. About 450 such science clubs were established during this period.

In the Third Plan, in addition to providing general science in all the secondary schools as a compulsory subject, more than 9500 out of 21,800 secondary schools will also have science of an elective standard. The completion of this programme is expected to provide a more satisfactory foundation than at present for the further expansion of science education at the university stage during the Third and subsequent Plan periods. A number of supporting measures are also proposed to be taken to improve and strengthen the teaching of science. The existing science syllabi in force in different States will be reviewed and modified where necessary, with a view to integrating them with the science syllabi at the earlier and later stages of education. A programme of preparation of teachers' handbooks, students' manuals, science text-books and supplementary reading material in science will also be undertaken. The present shortage of science teachers will be made up to as large an extent as possible by increasing facilities of science education at the university stage and by providing various types of in-service training in content and methodology for the existing science teachers. The training of laboratory assistants in the techniques of handling laboratory apparatus will also be taken up during this period. In addition, steps will be taken to standardise designs of science apparatus and to get them manufactured in the country itself. In order to coordinate, guide and direct the entire programme of science teaching as well as the training of key personnel, a central organisation for science education is proposed to be set up in the Third Plan. A scheme of science talent search is to be introduced with a view to identifying promising talent at the secondary stage and providing opportunities for its development.

27. *Multipurpose schools.*—One of the main defects in the secondary education system was its unilateral character, only one type of academic course being provided for all students irrespective of their individual

programme of in-service training, covering seminars, workshops and conferences, audio-visual, library and guidance services and publications. Each centre provides extension service to a number of schools in the area allotted to it (the number varying from 100 schools to over 300 schools), and intensive training for a group of selected schools (about 20) in the immediate neighbourhood. The extension service programme has been found to be a valuable medium for continuous in-service training and as a means of keeping the training colleges and the secondary schools in close touch with each other. It is proposed to extend the scheme to a larger number of training colleges during the Third Plan with the ultimate object of making extension service an integral part of the work of every training college.

UNIVERSITY EDUCATION

33. With the expanding base at the elementary and secondary education, the demand for higher education has greatly increased over the past decade. The number of universities has increased from 27 in 1950-51 to 32 in 1955-56 and to 46 in 1960-61, and about a dozen more universities are likely to be added during the Third Plan. The number of colleges (exclusive of intermediate colleges) rose from 772 in 1955-56 to 1050 in 1960-61. During the Third Plan about 70 to 80 colleges will be added every year. The rapid expansion in the numbers of universities and colleges in recent years has led to a number of problems. These have been reviewed in the report of the University Grants Commission for 1959-60.

The Commission has stressed that if deterioration is to be avoided, increase in the number of students should be accompanied by corresponding expansion of physical and other teaching facilities. In the Third Plan larger facilities are being provided for diverting students to vocational and technological education. However, the problem is one of large dimensions and, even after taking into account these facilities, the number of those seeking admissions to the courses of higher education in arts, science and commerce will be large and suitable criteria for selection have to be adopted. In addition to the provision in the Plan for expansion of facilities for higher education, proposals for evening colleges, correspondence courses and the award of external degrees are at present under consideration.

34. *Science education.*—The programme for expanding facilities for science education during the Third Plan has been described earlier. This will involve larger provision of scientific equipment as well as appointment of more science teachers. It is proposed to prepare standard lists for scientific equipment for the guidance of educational authorities. Schemes will also be initiated for the manufacture and supply of such

crafts is one of great importance both for secondary education and for vocational education. A special study of the problem is, therefore, being undertaken by the Ministry of Education, and the findings of the study will be utilised to formulate a programme for craft and vocational education.

30. *School libraries.*—Another aspect of secondary education which needs particular attention is the organisation of school libraries. Steps were taken in the First and the Second Plans for the improvement of school libraries but much remains to be done in the way of ensuring better utilisation of library facilities and improving the reading habits of pupils. Use of library resources has to be an integral part of class teaching. During the Third Plan it is proposed to set up a few model school libraries in the demonstration schools attached to selected training colleges to serve both as models for the organisation and running of libraries as well as training centres for teacher librarians. A study is already under way of the existing organisation of the secondary school libraries and the directions in which improvement should be undertaken.

31. *Post-basic schools.*—In some States post-basic schools were started by way of continuation at the secondary stage of senior basic schools. There are at present about 66 such schools. The relationship between post-basic schools and higher secondary schools has been recently considered by a committee, and it is proposed that these schools should be assisted to improve their standards of curriculum, instruction, equipment, laboratory and staff, so as to place them at par with the higher secondary and multipurpose schools. Until these steps have been taken, the school final examination of the post-basic schools may be regarded as equivalent to certificates awarded to students of higher secondary schools for employment and other purposes.

32. *Training of teachers.*—The number of training colleges has risen from 53 in 1950-51 to 236 in 1960-61. In the Third Plan the number of training colleges is expected to increase to 312. The existing training colleges will also be strengthened and expanded to increase the supply of trained teachers. While these measures take care of the numerical supply of trained graduate teachers, steps will also have to be taken to reorganise and strengthen the training college programme in order to align it with the current needs of the secondary school. Special emphasis in this matter will be given to pre-service training of teachers in science and social studies, introduction of new techniques of evaluation, provision of a variety of special subjects, such as guidance and audio-visual education and the organisation of research.

To provide in-service training facilities for secondary school teachers, extension centres were established during the Second Plan at 54 selected training colleges. These centres have been carrying out a comprehensive

37. *Rural institutes.*—Eleven Rural Institutes were established in the Second Plan with the object of providing higher education after the secondary stage to the rural students in their own setting for developing rural leadership, and for stimulating active participation of the rural population in welfare and community development programmes. The Institutes were intended to train rural youth for specialised jobs in fields like rural development, cooperation, social welfare, social education and small-scale industries. Diploma courses in rural services, rural civil engineering, agriculture and health services were offered in the rural institutes. The enrolment of the Institutes by the end of the Second Plan was over 2300 and the annual output in various courses was over 500.

This scheme is still in an experimental stage and will be continued in the Third Plan, so that the Institutes can develop their activities fully. The working of a few rural institutes was assessed by special committees and measures for improvement have been taken in the light of their recommendations. In the Third Plan, it will be necessary to examine the full potentialities of these Institutes and their contribution towards meeting the manpower requirements for rural development so as to equip them fully to the development needs of rural communities.

38. *Three-year degree course.*—With a view to bringing about qualitative improvement in higher education, in most of the universities, the three-year degree course in arts, science and commerce following the higher secondary school examination or a year's course at the pre-university stage after the present matriculation or equivalent examination, has been already introduced. The three-year degree course also includes other reforms such as improvement in the teacher-pupil ratio, introduction of tutorial system, general education, improvement of libraries, laboratories and instructional buildings. Periodical conferences, seminars, summer schools and refresher courses will continue to be organised as in the Second Plan for teachers in different subjects. Teachers will also obtain special grants for visiting centres of research for short periods. Among additional amenities for students are the provision of hostels, hobby workshops, non-resident students' centres, health centres, counselling and student aid funds. These will continue in the Third Plan.

Girls' Education

39. Some aspects of the problem of girls' education at different stages have been touched upon earlier in the discussion of elementary, secondary and university education. There are a few broader aspects of the subject which need further consideration. Over the past decade, while the additional number of boys enrolled in schools was 13·2 million, in the case of girls the additional enrolment was only 6·8 million. The census of 1961 has shown that, as against a literacy rate of 34 per cent for men, only about 13 per cent of the women are literate. Consequently, by

equipment at low cost. A large number of scholarships will be provided to the meritorious science students. A continuing review of standards of teaching and examination in science and technology, at all levels, will also be carried out and preparation and publication of standard text-books for use in the education programmes will be undertaken.

35. *Post-graduate studies and research.*—Post-graduate studies and research in science and humanities will be further expanded in the Third Plan. Assistance was made available to universities during the Second Plan for additional accommodation, laboratory equipment and library facilities. Measures taken by the University Grants Commission during the Second Plan related to the development of new departments in universities in specialised fields of scientific study such as geophysics, astronomy, astrophysics, applied geology, oceanography, applied physics and animal genetics. In humanities, departments of Buddhistic and African studies and institutes or departments were developed for studies in Hindi, linguistics and social sciences, and for archaeology, museology, music, etc. The University Grants Commission also initiated a scheme during the Second Plan for awarding post-graduate and research scholarships and fellowships. Programmes initiated during the Second Plan will be continued and further developed during the Third Plan. The University Grants Commission will assist universities and post-graduate departments of colleges in the development of post-graduate studies and research, special emphasis being placed on science education. The number of students expected to undertake post-graduate studies in science courses is expected to increase by about 7000 for post-graduate studies and 1000 for research. In all, there will be an increase of about 70 per cent in the enrolment of science students at the post-degree level. The number of additional arts students will be 7000 and 2000 respectively.

36. *Women's education.*—Shortages of educated women available for taking up various occupations point to the need for increasing the proportion of women students in colleges and universities. The proportion of women students to the total enrolment in Indian universities was about 13 per cent in 1955-56 and about 17 per cent in 1960-61, and is expected to be about 21 per cent in 1965-66. Apart from providing facilities for the increasing numbers of women students, during the Second Plan, courses of special interest to women were initiated, such as Home Science, Music, Drawing, Painting, Nursing, etc. These facilities will have to be further expanded. During the Second Plan, the University Grants Commission provided liberal assistance for women's colleges and women's hostels. This will be continued in the Third Plan. Further, in order to encourage women students, special scholarships will continue to be provided. A proposal for setting up an institute for training women in organisation, administration and management is at present under examination.

studentships and other financial concessions were available to about 50 lakhs of students—1·5 lakhs in colleges and universities and 48·5 lakhs in schools. The proportion of students in colleges and universities receiving scholarships and stipends was 9 per cent in 1950-51, and is at present estimated to be about 16 per cent. These scholarships will be continued in the Third Plan.

An important scheme for scholarships is that relating to post-matriculation scholarships for scheduled tribes, scheduled castes and other backward classes which was taken up several years ago and now benefits over 50,000 students at an annual cost of Rs. 2·7 crores. At the pre-matriculation stage, 4 to 5 million children belonging to these groups received scholarships and other concessions in 1960-61, and the expenditure incurred under this head during the Second Plan was Rs. 12 crores.

42. In the Third Plan, provisions for new scholarships in different fields are as follows:

education programme	
pre-university stage	4·0
university stage	6·0
programme for the welfare of backward classes	
pre-university stage	11·0
university stage	6·0
technical and vocational education	
engineering and technology	8·0
craftsmen	2·0
total	37·0

Besides the provisions mentioned above, there are research scholarships and fellowships provided by the University Grants Commission and scholarship schemes in fields such as agriculture, health, scientific research, etc.

43. State plans provide for extension of the existing schemes for scholarships. Among schemes undertaken by the Ministry of Education reference may be made to national scholarships for outstanding students at the post-matriculation stage, scholarships for overseas studies and a wide range of scholarships offered to Indian students by foreign countries and by international agencies. Under the programme for the welfare of backward classes, it is expected that the number of scholarship-holders in the school stage will increase to about 7 million. In the field of technical education, it is expected that as against about 6000 students now receiving scholarships or other assistance, the number will rise to about 32,000 or 18 per cent of the total enrolment.

far the most important objective in the field of education during the Third Plan must be to expand facilities for the education of girls at various stages. According to the programmes which have been formulated, taking age-group 6—14, the proportion of girls at school should increase to 46 per cent, compared to 73 per cent for boys. Out of about 20·4 million additional children to be enrolled in schools during the Third Plan in the various age-groups, about 10·3 million are expected to be girls, their proportion in the lowest age-group being 56 per cent. At the end of the Third Plan, the disparity between boys and girls, although somewhat reduced, will still be considerable. Even to achieve the estimates mentioned above, a massive effort will be needed throughout the country and, more especially, in those States where the education of girls has seriously lagged behind.

40. It is estimated that of the resources available under the Plan for the development of education about Rs. 175 crores will be devoted to the education of girls, of which about Rs. 114 crores are for education at the primary and middle school stages. As stated earlier, some provision has also been made for special schemes intended to support the general programme for girls' education. It is suggested that in implementing the various provisions made for girls' education in their plans, States should keep in view detailed recommendations contained in the Report of the National Committee on Women's Education. As has been pointed out, special emphasis must be laid on creating suitable conditions for encouraging parents to send their daughters to schools, educating public opinion, increasing the number of women from rural areas who will take up the vocation of teaching and inducing women from urban areas to accept posts of teachers in rural schools. It is proposed to evaluate carefully from year to year the progress made in implementing the programme for girls' education and to take such further measures as may be needed for realising the targets set for the Third Plan. In the field of girlds' education, it is specially necessary to study closely such successful methods as may be evolved in different parts of the country and to make such experience available generally. In drawing up annual plans also, care should be taken to see that the programme for girls' education is not held back for lack of financial resources and that the social and organisational limitations which impede progress at present are eliminated as early as possible.

SCHOLARSHIPS

41. Expenditure on scholarship programmes rose from about Rs. 3·5 crores in 1950-51 to over Rs. 8 crores in 1955-56 and to about Rs. 11 crores in 1957-58. It is expected to increase to about Rs. 18 crores by 1960-61. The number of scholarship-holders rose from 3·6 lakhs in 1950-51 to 8·8 lakhs in 1956-57. Of the latter about 7·8 lakhs were in schools and about 1 lakh in colleges and universities. In addition to this, by 1956-57 free

is especially important in India today where the whole system is being modified to suit the changing needs of a rapidly developing society. During the first two Plans, a number of research institutions were set up. The National Institute of Basic Education has conducted a series of investigations into various problems connected with basic education and has organised short-term training courses and seminars for key personnel in the States and published a number of valuable studies on various problems. The National Fundamental Education Centre has studied problems of social education and trained a number of batches of District Social Education Organisers. The National Institute of Audio-visual Education carries out research in various media of mass communication—both ancient and modern—and has organised a number of seminars for key personnel working in this field. The Central Bureau of Educational and Vocational Guidance has built up a number of objective tests for conducting examinations in different subjects and for assessing the special abilities and aptitudes of students with a view to guiding them in their choice of courses and careers. The Bureau organises seminars and short-term courses for guidance personnel in the States. In addition to the development of vocational and educational guidance, these measures will facilitate the introduction of mental health services in schools and colleges, including counselling for personal and emotional problems of students. The Ministry of Education has assisted in the setting up of similar units also in the States. The Central Bureau of Text-book Research studies text-books adopted in various States from the point of view of their content as well as the procedures followed in their selection. Criteria for evaluating text-books have also been worked out, and workshops for training writers in the preparation of text-books are also arranged.

47. Training colleges were assisted during the Second Plan in carrying out investigations into problems of secondary education. The Directorate of Extension Programmes for Secondary Education has studied various problems pertaining to secondary education such as examination reform, syllabi for new subjects for reorganised secondary schools, problems of science education, diversification of courses and others.

48. During the Third Plan research activities described above will be continued and expanded. With a view to developing at the national level a centre of training and research, it is proposed to establish National Institute of Educational Research and Training in which will be merged the existing Central Institute of Education and other Central Institutes and agencies referred to above. It is proposed that the National Institute of Educational Research and Training should be an autonomous organisation and that its functions should cover different areas of educational research, including elementary, secondary, social and audio-visual education, as also the training of key personnel in these and other fields. The pro-

44. In view of the importance attached to scholarships in the Third Plan, it is suggested that State Governments and the Central Ministries concerned should review their existing schemes with the object of ensuring that, subject to continued good performance, the rules under which scholarships are given do in fact enable promising students in need of assistance to complete their education and that ordinarily help is not discontinued at intermediate stages. For such students there should be adequate provision not only at the post-matriculation stage, but also in the secondary classes. In the case of students drawn from the economically backward sections, the aim should be to ensure adequate provisions for the numbers forthcoming and also for assisting an increasing proportion to reach the higher stages in education. It has been observed that because a sufficient number of qualified candidates are not forthcoming, administrative regulations regarding reservation of posts for this section of the population are not always fully implemented. Finally, there are some categories of personnel required in large numbers for which, in the ordinary course, there would be inadequate supply of candidates, for instance, science teachers, women teachers, nurses, etc. Such categories should be carefully identified in each State and an attempt made to select promising students at the post-matriculation stage and assist them with scholarships and stipends through the entire period of training. They should be given the prospect of assured employment and should, in return, be under obligation to serve for prescribed periods.

Teachers' Salary Scales and Conditions of Service

45. The problem of raising the salary scales of teachers received special attention towards the end of the First Plan. Durring the Second Plan considerable progress was made and expenditure of about Rs. 30 crores is estimated to have been incurred on increasing the salaries of school teachers. As a result, the basic salaries of elementary teachers and, to some extent, of secondary teachers, were improved in almost all the States. In addition, expenditure was incurred on raising the salary scales of university teachers. In the Third Plan provision has been made by some of the States for improving the salaries and allowances of teachers.

Attempts will continue to be made during the Third Plan to improve the social and economic status of teachers. The institution in 1958 of national awards for outstanding work in the field of teaching is a useful innovation. The number of these awards is to be increased in the Third Plan. The Plan also provides for merit scholarships for the children of elementary and secondary school teachers.

Educational Research and Training of Key Personnel

46. Any system of education requires for its growth a vigorous programme of research in educational objectives, methods and techniques. It

(iii) making corresponding changes in internal examinations;

(iv) giving increasing weightage to internal assessment; and

(v) introducing improvements in teaching techniques and curricula in the light of the educational objectives indicated for each subject.

The programme so far accomplished has helped to introduce a large body of teachers to the new concepts and techniques through seminars and workshops and to make training colleges, secondary school boards and others familiar with the problems of the examination reform. Considerable preparatory work has also been in progress. Work along the lines mentioned above will be intensified during the Third Plan. It is also proposed to set up State evaluation units which will work in co-ordination with the Central unit in implementing the programme. The University Grants Commission has assisted the establishment of examination research units in three universities. Further research work will also be organised and evaluation personnel trained in larger numbers. Research and evaluation units will be set up in some of the universities.

51. *Development of Hindi and Sanskrit.*—For the development of Hindi, during the first two Plans schemes were initiated for the evolution of Hindi terminology, production of dictionaries and original literature, translation of books of university level into Hindi and regional languages, and publication of popular books in Hindi through private publishers. Financial assistance was given to voluntary institutions engaged in the propagation of Hindi. Books were distributed as 'free gifts' to school libraries and other educational institutions in the non-Hindi speaking areas. Grants were given to certain States for the expansion of facilities for the training of Hindi teachers and for setting up Hindi teachers' training colleges. Funds were also provided for the appointment of Hindi teachers in secondary schools in non-Hindi speaking States as well as for revising their pay scales. The programmes and schemes started during the First and Second Plans will be continued and expanded in the Third Five Year Plan.

52. In order to consider the question of the state of Sanskrit education in the country in all its aspects and recommend measures for its development, the Ministry of Education appointed the Sanskrit Commission, which made its recommendations in 1957. Implementation of these recommendations commenced during the Second Plan. The Central Sanskrit Board was set up in 1959 with a view to advising the Government of India on matters relating to propagation and development of Sanskrit and some steps have been taken in consultation with it. Programmes for the Third Plan will include production of literature, research scholarships, development of Gurukulas, modernising Sanskrit pathashalas, preparation

gramme of extension services through the training institutions will be coordinated and guided by the National Institute.

Extension departments will be started in 120 elementary teacher training institutions, which will take up research in selected areas and provide in-service training for elementary school teachers.

Text-Books

49. The problem of text-books has been assuming greater urgency in recent years. The main aspects to be considered in a text-book are its content, method of presentation, printing, get-up and price. The procedure for selection of text-books is another important question. To overcome difficulties experienced in respect of text-books, State Governments have started, on an experimental basis, 'nationalisation' of text-books. The experiment is too brief to warrant definite conclusions being drawn from it. Steps will have to be taken to select, train and encourage writers and illustrators, to increase the supply of paper and to provide suitable printing machinery. The Centre and the States will need to coordinate their efforts in large scale production of text-books with a view to reducing costs as well as keeping certain national objectives uniformly in view. To bring down the price of foreign books, on which inevitably considerable reliance has to be placed at the university stage, arrangements for getting them printed in India are under examination. The interest of Indian writers must, of course, be fully safeguarded. The problem of translation of standard text-books into various languages and the writing of original books in these languages have become important in view of their greater use in the universities.

Examination Reform

50. The existing examination system has become inadequate for the needs of secondary education which has expanded in the scope and variety of its objectives. It has come in for considerable criticism in recent years. The Secondary Education Commission laid special emphasis on the need for improvement of the examination system. A programme of examination reform was, therefore, taken up towards the end of the Second Plan when an Evaluation Unit was set up in the Directorate of Extension Programmes for Secondary Education. The programme envisages the reform of examination techniques in gradual stages and is designed for the following purposes:

(i) identifying and defining the specific educational objectives underlying the study of various school subjects;

(ii) aligning the techniques of external examinations to these objectives, so that the examination questions and other tests may measure the attainments with reference to them;

action'. Social education, thus, comprises literacy, health, recreation and home life of adults, training in citizenship and guidance in improving economic efficiency. In the last analysis, in the setting of democracy, the success of planned development, which encompasses the needs of millions of people, depends on the spread of social education and a progressive outlook and the growth of a sense of shared citizenship. Yet, the educational aims of agriculture, community development, health and other welfare programmes are among the most difficult to realise. Over the past decade, in several directions there has been a measure of progress, as in the development of community centres, reading rooms in villages, organisation of youth groups and mahila mandals, and the revitalisation of village panchayats and the cooperative movement. One aspect of social education, and in some ways the most important, has, however, caused concern. Between 1951 and 1961, literacy has increased only from about 17 to about 24 per cent. The introduction of Panchayati Raj at the district and block levels and the important role assigned to village panchayats render it imperative that in as short a period as possible a substantial proportion of the adult population should become capable of reading and writing. This is essential in their own interest as in that of the community as a whole. As sufficient progress has not been achieved so far in this direction, the problem is now being studied afresh with a view to working out means for the rapid expansion of adult literacy.

56. Programmes of the Ministry of Education provide for the further development of the National Fundamental Education Centre as a part of the National Institute of Education, production of literature for neo-literates, assistance for voluntary organisations in the field of social education and expansion of library facilities. The educational plans of States provide for libraries and continuation classes and, to a limited extent, for adult schools and other schemes for promoting adult literacy. The main provisions for social education are made under the community development programme through the schematic budget. Altogether, in the Third Plan, about Rs. 25 crores are expected at present to be available for social education.

57. Any large-scale and effective programme for adult literacy must be based on the closest possible cooperation at every level of personnel engaged in education and in community development. It will call for a pooling of the available resources in men and money, mobilisation of voluntary workers and organisations and development of adult education and literacy work at the block and village levels, and in every city and town, so that it takes the character more and more of a popular movement. Social education and adult literacy have to be developed as extension activities undertaken by educational institutions, specially village schools, in collaboration with panchayats and cooperatives and voluntary organisations. The broad aim should be that wherever a group of persons sufficient to constitute a class desires to attain literacy, the requisite facilities by

of dictionaries and establishment of Central Sanskrit Institute for training teachers. Some States have also provided for programmes along these lines.

53. *Education of the handicapped.*—During the Second Plan several schemes for the education and training of the handicapped were initiated. These will be continued in the Third Plan. The National Centre for the Blind will be strengthened and a national Braille library started. A training centre for the adult deaf and a school for the mentally deficient children will also be established. The scheme of scholarships under which assistance is given for higher education and also for technical and professional education to the handicapped students will be further expanded. Emphasis will be laid on the development of services for the handicapped through voluntary agencies and on the provision of special employment exchanges for the physically handicapped.

Physical Education, Sports and Youth Welfare Activities

54. Among the significant developments in this field during the Second Plan reference may be made to the establishment of the National College of Physical Education at Gwalior (which was the first degree college of its kind in the country), the setting up of Bal Bhavans to cater to the recreational needs of children, the launching of a national physical efficiency drive on the basis of carefully graded physical tests and the organisation of youth groups in rural areas as part of the community development programme. Towards the end of the Second Plan the National Institute of Sports was set up for training high grade coaches in different games and sports. In the sphere of youth activities, grants were given for the construction of stadia, swimming pools, open-air theatres, etc. Steps were also taken for the promotion of the activities of the National Cadet Corps, Auxiliary Cadet Corps, Bharat Scouts and Guides and the National Discipline Scheme.

During the Third Plan period all these programmes will be continued. The National Institute of Sports will be developed so as to provide for all the major games. With the help of coaches trained at the Institute, a national coaching scheme providing for widespread coaching facilities will be introduced so that the standard of sports can be steadily raised. The national physical efficiency drive will be further intensified so that it has greater impact. A National Children's Museum is also proposed to be established as a complement to the Bal Bhavan.

Social Education and Adult Literacy

55. As was stated in the First Plan, social education implies 'an all-comprehensive programme of community uplift through community

reorganisation and development of museums and libraries and preparation of gazetteers which will be developed through the Third Plan.

Work of revision of District and Indian Gazetteers initiated during the Second Plan will be carried further. A scheme for the publishing of ancient manuscripts, cataloguing and preserving them and building up a microfilm library of rare manuscripts and for the acquisition of such manuscripts forms part of the Plan.

60. Along with Hindi and Sanskrit, it is of the utmost importance to develop modern Indian languages. It is proposed to undertake the preparation of bi-lingual dictionaries, award prizes for translations, arrange for the preparation of encyclopaedias in the various regional languages, and of English-Indian language dictionaries, and publish old manuscripts and rare books as well as catalogues and bibliographies. The Plan also provides for the linguistic survey of India.

Contemporary Indian literature has been surveyed recently by the Sahitya Akademy. The National Book Trust is taking steps to encourage the production of good literature and to make such books available at moderate prices for libraries, educational institutions, and the public in general. The National Book Trust also aims at translation of well known books from foreign languages and of standard books from one Indian language into another.

In the development of India's cultural unity, considerable importance must be attached to the propagation of Indian languages and their literatures in different parts of the country. This aspect has been emphasised by the Central Advisory Board of Education which has recommended the study at the secondary stage by every student of an Indian language other than his own mother-tongue. Facilities for the study of Indian languages are being provided at some universities. In the context of the Third Plan they need to be established on a much wider basis.

61. Reorganisation and development of museums will be undertaken on the lines recommended by the Expert Museum Survey Committee, 1955, and on the advice of the Central Advisory Board on Museums which has been established for this purpose. A project for the acquisition of art collections for the National Gallery of Modern Art is included in the Plan, and committees have been set up to advise the Government. The Salar Jung Museum at Hyderabad has been taken over by the Central Government and will be developed as a National Museum for the South India.

62. The Department of Archaeology has schemes like assessment of Monuments, copying of ancient paintings and survey of antiquities which will be continued in the Third Plan along with the strengthening of the Excavations Branch. A National Trust will be established to

way of teachers and teaching materials should be made readily available. Every educational institution should be involved in this effort, and individual teachers participating in it should be given suitable honoraria. At the same time, the village panchayat and other agencies should make their due contribution towards the effort. While Social Education Organisers, Block Education Officers and individual educational institutions should work closely together to place the facilities needed at the service of local communities, it will be primarily for Panchayat Samitis, village panchayats and voluntary organisations to create and maintain popular enthusiasm and develop adult education and literacy on a continuing basis in a manner related organically to their own needs and conditions. At every step the local leadership, the teachers and the voluntary workers should be drawn into the movement for the expansion of literacy both among men and among women. Proposals for a large-scale programme of adult literacy on these lines are being drawn up by the Ministry of Education in consultation with the Ministry of Community Development and Co-operation, and it is hoped that appreciable progress will be realised during the Third Plan.

58. *Libraries.*—An adequate system of libraries is an essential part of any well-organised system of education. The Library Committee which reported in 1959, set up by the Government of India indicated the large gaps between the present position and the demands of an adequate system of libraries. These can, however, only be filled through a long term and properly phased programme. During the Third Plan, steps will be taken to set up or develop all the four National Libraries at Delhi, Calcutta, Bombay and Madras. There are provisions also for strengthening libraries at the State headquarters and for increasing the number of libraries at the district and taluka levels. Besides these, educational institutions have libraries of their own. These will be improved and strengthened during the Third Plan. An Institute of Library Science was set up during the Second Plan to train key library personnel. This will be further developed during the Third Plan. Other universities also have facilities for research in library science and facilities for training library personnel.

Cultural Programmes

59. India's exceptional heritage in art, literature, dance, drama and music has to be further developed in response to the urges of a new generation. Archaeological monuments and ancient art are to be preserved and re-interpreted for communicating India's underlying cultural unity. Among important steps already taken are the establishment of the Lalit Kala Akademy (academy of fine arts), the Sahitya Akademy (academy of letters) and the Sangeet Natak Akademy (academy of dance, drama and music), the National Museum and the National Gallery of Modern Art. The other schemes carried out in the Second Plan were the

The school programme should be designed to awaken in the pupils an awareness of national oneness and for this purpose, includes community living based on cooperative self-help and democratic principles, the study of India's history and culture in the curriculum at various stages of education and suitable textbooks to inculcate moral and social values among students. The school programme has to be supplemented by other activities such as programmes for bringing students together on a common platform and enabling them to gain first-hand knowledge of the diversified culture of the country through educational tours, the development of modern Indian and classical languages and making their rich store-house of literature available to larger numbers in different parts of the country through translations and the revival and development of India's composite cultural heritage through fine arts, dance, drama, music and literature. Various steps taken to create more widespread understanding of the Plan among students are intended to strengthen the forces of integration and national unity in a positive and constructive manner. One State Government has recently approved a scheme of 100 scholarships a year to be given to graduate and post-graduate students from different States with provision for residential facilities. Proposals on these lines can be of great value in promoting national integration.

The question of achieving emotional integration and promoting national consciousness is at present being studied by a special committee, with reference to the system of education and educational policies and programmes will need to be reviewed further in the light of such recommendations as it may offer.

look after places of historical interest and national beauty which do not fall within the purview of the Department of Archaeology.

63. The Third Plan provides for research in the field of Anthropology and Ethnography.

Trained personnel required for the various schemes will be made available and creative talent encouraged through scholarships for students and young workers in different cultural fields. Along with these, a few overseas scholarships have also been included.

64. Cultural relations with other countries will continue to be encouraged during the Third Plan. Among schemes subserving this objective are the development of the Indian Council for Cultural Relations, construction of the International Students' Home in the Delhi University and re-productions of paintings, sculptures and Indian Art for the use of cultural organisations in foreign countries.

The scheme for establishing Buddha Jayanti monument in Delhi which started in the Second Plan will be completed in the Third Plan. Existing institutions of higher learning and research will be further developed.

65. Among other programmes are the setting up of a National Theatre and also a large open-air theatre in Delhi.

In the Second Plan an expenditure of Rs. 4 crores was incurred on various cultural programmes, Rs. 2·6 crores at the Centre and Rs. 1·4 crores in the States. The Third Plan allocation is Rs. 10 crores—Rs. 6 crores at the Centre and Rs. 4 crores in the States.

National Integration

66. The success of economic planning in India will largely depend upon our capacity to hold together as a nation in the midst of diversity of language, region, caste and religion. Unity in a democracy must be based on the consciousness of a common cultural heritage and commonly accepted future goals and on a constant effort to realise them. India has a rich and composite culture to which every section of the community has contributed and of which it has every reason to be proud. The essentials of this culture are broad-mindedness and mutual tolerance, balance between the material and the spiritual, and the cooperative way of life in which various individuals in a group are bound together by commonly accepted rights and obligations. India's future goals are embodied in the Constitution and her development plans are among the principal means for realising them.

67. Educational institutions have a vital role to play in bringing about national integration and social cohesion among the younger generation.

ANNEXURE II

Schooling facilities for children in the age-group 11—14 (1960-61 and 1965-66)

name of the State	enrolment in classes VI—VIII (lakhs)						percentage of the population in the age-group 11—14 (estimated)					
	1960-61			1965-66			1960-61			1965-66		
	total	boys	girls	total	boys	girls	total	boys	girls	total	boys	girls
Andhra Pradesh	3·55	2·74	0·81	6·13	4·68	1·45	15·6	23·9	7·2	21·9	33·1	10·4
Assam	2·05	1·49	0·56	3·25	2·20	1·05	27·4	37·4	16·0	35·3	44·8	24·5
Bihar	5·50	4·90	0·60	9·25	7·40	1·85	19·4	34·3	4·2	26·7	42·6	10·7
Gujarat	3·56	2·67	0·89	5·77	3·56	2·21	26·8	39·0	13·8	34·9	41·8	27·6
Jammu & Kashmir	0·60	0·51	0·09	0·88	0·72	0·16	27·8	44·0	9·0	33·5	51·4	13·0
Kerala	5·44	3·18	2·26	6·19	3·61	2·58	50·3	59·4	41·3	45·3	53·4	37·3
Madhya Pradesh	3·27	2·73	0·54	4·96	4·16	0·80	16·3	26·6	5·5	20·3	33·3	6·7
Madras	6·36	4·44	1·92	9·36	6·57	2·79	30·1	41·8	18·3	35·9	50·1	21·5
Maharashtra	7·25	5·35	1·90	11·47	8·22	3·25	28·5	40·7	15·5	36·2	50·2	21·2
Mysore	3·64	2·66	0·98	5·64	3·66	1·98	23·8	34·1	13·1	29·5	37·5	21·2
Orissa	0·85	0·74	0·11	1·70	1·36	0·34	7·9	13·8	2·0	13·1	21·0	5·2
Punjab	3·75	2·75	1·00	5·55	3·54	2·01	28·3	38·8	16·3	33·8	40·3	26·4
Rajasthan	1·91	1·66	0·25	3·85	3·10	0·75	14·8	24·5	4·1	23·9	36·7	9·8
Uttar Pradesh	8·60	7·50	1·10	11·60	10·00	1·60	18·6	30·9	5·0	20·5	33·7	5·9
West Bengal	4·72	3·60	1·12	9·02	5·30	3·72	21·1	30·3	10·7	33·3	36·7	29·4
Delhi	1·02	0·70	0·32	1·65	1·06	0·59	60·4	73·7	43·2	67·3	84·1	49·6
Himachal Pradesh	0·20	0·17	0·03	0·30	0·25	0·05	28·6	45·9	9·1	36·6	59·5	12·5
Pondicherry	0·08	0·06	0·02	0·10	0·07	0·03	33·3	50·0	16·7	35·7	51·0	21·4
Other Union Territories	0·53	0·37	0·16	0·81	0·54	0·27	38·1	52·9	23·2	43·5	58·1	29·0
total	62·88	48·22	14·66	97·48	70·00	27·48	22·8	34·3	10·8	28·6	39·9	16·5

ANNEXURE I

Schooling facilities for children in the age-group 6—11 (1960-61 and 1965-66)

name of the State	enrolment in classes I—V (lakhs)						percentage of the population in the age-group 6—11 (estimated)					
	1960-61			1965-66			1960-61			1965-66		
	total	boys	girls	total	boys	girls	total	boys	girls	total	boys	girls
Andhra Pradesh	28·20	17·50	10·70	44·20	25·40	18·80	60·3	74·0	46·2	84·5	96·1	72·7
Assam	10·68	6·79	3·89	15·08	8·99	6·09	61·7	73·7	48·0	77·4	86·6	66·9
Bihar	32·00	24·00	8·00	48·00	30·00	18·00	53·5	80·0	26·9	72·6	90·4	54·7
Gujarat	20·00	12·30	7·70	26·63	15·62	11·01	72·0	85·9	57·3	84·2	95·8	71·9
Jammu & Kashmir	1·97	1·54	0·43	3·02	2·24	0·78	45·0	66·1	21·0	62·3	87·2	34·2
Kerala	23·44	12·58	10·86	26·61	14·28	12·33	108·8	118·0	99·7	108·7	117·8	99·7
Madhya Pradesh	20·00	16·00	4·00	30·00	20·00	10·00	47·0	73·5	19·3	64·0	83·3	43·8
Madras	33·50	21·26	12·24	47·50	25·50	22·00	78·9	99·7	58·0	100·0	106·8	93·1
Maharashtra	39·00	24·47	14·53	54·00	32·30	21·70	73·3	89·0	56·6	90·5	104·8	75·3
Mysore	21·44	13·64	7·80	31·44	16·08	15·36	67·4	84·0	50·1	88·2	88·4	88·1
Orissa	10·00	7·50	2·50	16·00	10·50	5·50	47·8	71·6	23·9	64·6	85·0	44·3
Punjab	16·86	12·26	4·60	22·86	15·00	7·86	61·8	84·0	36·3	74·6	91·4	55·2
Rajasthan	11·51	9·51	2·00	21·00	13·90	7·10	42·0	66·2	15·3	68·2	86·2	48·4
Uttar Pradesh	40·43	32·00	8·43	66·50	45·00	21·50	45·4	68·6	19·9	61·7	79·5	41·9
West Bengal	28·52	18·67	9·85	35·02	21·50	13·52	65·6	80·8	48·4	73·4	84·5	60·7
Delhi	2·91	1·68	1·23	4·08	2·21	1·87	86·6	89·3	83·1	99·5	104·2	94·4
Himachal Pradesh	0·80	0·63	0·17	1·14	0·71	0·43	48·8	73·3	21·8	69·5	83·5	54·4
Pondicherry	0·35	0·20	0·15	0·47	0·25	0·22	72·9	83·3	62·5	87·0	92·6	81·5
Other Union Territories	1·79	1·23	0·56	2·80	1·68	1·12	62·6	84·2	40·0	78·2	91·8	64·0
total	343·40	233·76	109·64	496·35	301·16	195·19	61·1	80·5	40·4	76·4	90·4	61·6

CHAPTER XXX

TECHNICAL EDUCATION

THE broad policies governing personnel requirements and training programmes and assessment of manpower requirements for the Third and the Fourth Plans, which are among the basic conditions of economic development, have been discussed earlier. This Chapter sets out educational programmes in the field of engineering and technology and craftsmen training, which are designed to help in building up the trained technical personnel required for schemes of industrial development, teaching and research. In formulating these programmes, it has been recognised that advances in the field of science and technology will call from time to time for changes in patterns of training and for improvements in the system of education. Programmes for the Third Plan lay particular stress on increasing trained personnel in different fields at all levels, securing teachers in sufficient number, provision of scholarships and fellowships for talented students, introduction of part-time, short-term and correspondence courses, development of special courses in certain fields, the proper utilisation of the available physical facilities, reduction of wastage and promotion of research.

2. In engineering and technology, provision has been made in the Third Plan for expansion of facilities at the degree and diploma levels so as to increase the annual admissions from 13,860 for degree courses and 25,570 for diploma courses to 19,140 and 37,390 respectively. In addition, there is provision for different types of part-time and correspondence courses and for the establishment of some specialised institutes.

In the field of craftsmen training, apart from the schemes of various Central Ministries, States and individual industries, the intake of the Industrial Training Institutes will go up in the course of the Third Plan from 42,000 to 100,000. The four existing Central Training Institutes for Instructors, including one for Women Instructors, will be fully developed and three new institutes will be set up to meet the demand for trained instructors.

3. In the Third Plan, as against programmes for education estimated to cost Rs. 560 crores, Rs. 142 crores are accounted for by schemes of technical education in the field of engineering and technology. As against 13 and 19 per cent respectively in the First and Second Plans, technical education represents about 25 per cent of the outlay on education in the Third Plan.

ANNEXURE III

Schooling facilities for children in the age-group 14—17 (1960-61 and 1965-66)

name of the State	enrolment in classes IX—XI						percentage of the population in the age-group 14-17 (estimated)					
	1960-61			1965-66			1960-61			1965-66		
	total	boys	girls	total	boys	girls	total	boys	girls	total	boys	girls
			(lakhs)									
Andhra Pradesh	1·86	1·62	0·24	2·36	1·94	0·42	8·8	15·1	2·3	9·6	15·7	3·5
Assam	1·10	0·87	0·23	1·71	1·31	0·40	17·5	26·0	7·8	22·9	32·9	11·5
Bihar	3·10	2·90	0·20	5·00	4·40	0·60	12·4	23·0	1·5	17·3	30·3	4·2
Gujarat	1·48	1·14	0·34	2·26	1·53	0·73	12·2	18·2	5·8	15·9	20·8	10·6
Jammu & Kahsmir	0·20	0·17	0·03	0·27	0·23	0·04	9·9	15·9	3·2	11·8	18·9	3·7
Kerala	2·25	1·39	0·86	2·95	1·80	1·15	21·6	27·0	16·3	24·2	30·0	18·7
Madhya Pradesh	0·78	0·67	0·11	1·10	0·95	0·15	4·3	7·3	1·3	5·3	9·0	1·5
Madras	2·66	1·98	0·68	3·97	2·71	1·26	13·4	19·9	6·9	17·3	23·4	11·0
Maharashtra	3·15	2·42	0·73	4·97	3·78	1·19	13·6	20·1	6·5	18·2	26·8	9·0
Mysore	1·47	1·16	0·31	2·05	1·44	0·61	10·4	16·6	4·5	12·3	16·9	7·5
Orissa	0·40	0·36	0·04	0·80	0·67	0·13	4·2	7·5	0·8	7·4	12·4	2·4
Punjab	1·45	1·25	0·20	2·25	1·82	0·43	12·0	19·3	3·6	16·1	24·4	6·6
Rajasthan	0·86	0·79	0·07	1·53	1·33	0·20	7·4	13·0	1·3	11·2	18·6	3·1
Uttar Pradesh	5·12	4·60	0·52	7·40	6·60	0·80	12·2	20·9	2·6	15·3	26·1	3·5
West Bengal	2·38	2·00	0·38	5·30	4·00	1·30	11·2	17·6	3·8	21·9	31·1	11·5
Delhi	0·54	0·40	0·14	1·19	0·90	0·29	32·5	43·0	19·2	60·1	88·2	30·2
Himachal Pradesh	0·06	0·05	0·01	0·08	0·06	0·02	10·2	16·1	3·6	9·8	14·3	5·0
Pondicherry	0·03	0·02	0·01	0·06	0·04	0·02	13·6	18·2	9·1	23·1	30·8	15·4
Other Union Territories	0·19	0·12	0·07	0·31	0·20	0·11	12·8	16·0	9·6	16·4	21·1	11·7
total	29·08	23·91	5·17	45·56	35·71	9·85	11·5	18·4	4·2	15·6	23·7	6·9

6. The Third Plan includes provision for part-time and correspondence courses in different branches of engineering and technology, and detailed programmes are being worked out. Normally, correspondence courses will cater to the needs of persons between the ages of 20 and 35, so that their benefits may go specially to mature students. Development of part-time and correspondence courses will assist students in an organised way in qualifying for the membership of professional bodies like the Institution of Engineers.

A pilot scheme has also been prepared for providing training on a part-time basis to 1000 diploma holders in engineering at 12 centres under the Ministry of Defence. They will prepare for Sections A and B of the Associate Membership Examinations of the Institution of Engineers. Sandwich courses in mechanical engineering which were introduced during the Second Plan as an experimental measure at Calcutta and Madras will be organised in other Centres and may be extended to new fields.

7. Advances in science and technology emphasise the need for the study in technological institutions of basic sciences, such as mathematics, physics, chemistry, etc. This consideration has been stressed both by the University Grants Commission and the All India Council for Technical Education. In the Second Plan a Science Faculty, consisting of the Departments of Physics, Mathematics, Chemistry, Geology and Geophysics was added at the University of Roorkee. The Institutes of Technology generally provide for well-equipped Departments in scientific subjects.

8. The Indian Institute of Technology at Kharagpur, which was started in the First Plan, was declared by an Act of Parliament as 'an institution of national importance' in 1957. The Indian Institute of Science, Bangalore, was further developed for post-graduate studies in engineering and has been deemed to be a university under the provisions of the U. G. C. Act since 1959. Institutes of Technology have also been established during the Second Plan at Bombay, Madras and Kanpur.

9. During the Second Plan post-graduate courses in engineering and technology were organised in 34 selected engineering colleges and university departments. An expert committee has been appointed to review the progress of post-graduate courses and research and to suggest the lines on which further development in the field should proceed. Provision has been made at the Centre to carry out the recommendations of the Committee. In addition, to encourage post-graduate work and training in engineering colleges, provision has been made in the State plans to enable individual institutions to initiate research work. Students taking up post-graduate studies in engineering and technology are to receive stipends, and scholarships will also be awarded for research in engineering subjects.

For programmes of craftsmen training, compared to Rs. 13 crores in the Second Plan, a provision of Rs. 49 crores is made in the Third Plan for the development of industrial training institutes, the national apprenticeship scheme, evening classes for industrial workers and the training of craft instructors.

Programme of Expansion

4. Considerable expansion of facilities for engineering education has taken place during the Second Plan. The number of colleges has gone up from 65 to 100, the annual admissions increasing from 5890 to 13,860. The number of polytechnics which offer diploma courses has risen from 114 to 196 and their annual admissions have increased from 10,480 to 25,570. Over the Second Plan the annual outturn of graduates has risen from 4020 to about 5700 and of diploma holders from 4500 to over 8000. In the main, trained manpower neded for the Third Plan must come from institutions already established by the end of the Second Plan. In the field of technical education, it may be said that each Plan is essentially a preparation for the next.

5. With a view to meeting the likely demand for engineering graduates and diploma holders in the Fourth Plan, educational facilities will be created during the Third Plan. There will be 17 additional colleges, including 7 Regional Engineering Colleges. Eight regional colleges were approved for the Second Plan and all but one have started functioning. Each regional engineering college has an admission capacity of 250 students. The regional engineering colleges will also provide for training in special branches of engineering and technology such as mining, metallurgy, chemical engineering, etc., for which personnel in large numbers will be required in the Fouth Plan. The Third Plan provides for 67 new polytechnics, each with an admission capacity of 180 students or more. In addition, wherever feasible, the capacity of the existing institutions will be expanded. The following Table summarises the progress achieved so far and programmes for the Third Plan:

Engineering colleges and Polytechnics, admission capacity and outturn

year	degree courses			diploma courses		
	number of institutions	admission capacity	outturn	number of institutions	admission capacity	outturn
1950-51	49	4120	2200	86	5900	2480
1955-56	65	5890	4020	114	10480	4500
1960-61	100	13860	5700	196	25570	8000
1965-66	117	19140	12000	263	37390	19000

Information concerning the expansion proposed in different States is given in the statement in the Annexure to this Chapter.

12. The Administrative Staff College was established at Hyderabad in the Second Plan as a joint and cooperative enterprise of Government, private industry and commerce for the training of senior executives and administrators.

The programme for the introduction of the five-year integrated degree course in engineering and technology will be completed in most of the universities. Among other schemes for which the Third Plan provides are increased hostel facilities, the strengthening of Boards of Technical Education in the States, and the development of art education.

13. In 1960-61, about 2180 seats were secured in industrial firms and undertakings for the practical training of engineering graduates and diploma holders. The scheme for the award of practical training stipends will be continued and enlarged in the Third Plan. It is at present estimated that about 25 per cent of the annual out-turn of engineering graduates and about 12½ per cent of the outturn of diploma holders will be able to secure practical training facilities during the Third Plan as against 12 per cent and 3 per cent respectively in the Second Plan. In the case of mining, comprehensive training programmes according to the prescribed requirements will be arranged in association with the mining industry. Provision of hostels for these trainees will also be ensured wherever necessary.

14. A scheme for the establishment of junior technical schools for students in the age-group 14-17 was introduced in the Second Plan as an experimental measure and 38 such schools were set up. In the Third Plan 96 more junior technical schools will be established, for the most part as adjuncts to polytechnics. Technical institutions for girls and women are also provided for in the plans of States.

15. In the Indian Institutes of Technology and the Regional Colleges, scholarships have been provided for 25 per cent of the students. In other institutions, however, the available provision for scholarships for engineering and technological studies has been extremely limited. It is hoped to remove this deficiency to some extent in the Third Plan, which provides Rs. 8 crores for merit and loan scholarships in this field in addition to the existing provisions. It is expected that in the Third Plan, for the country as a whole, financial assistance will be available to over 18 per cent of the students admitted in technical institutions as compared to 5 per cent at the end of the Second Plan. Apart from other aspects, the larger number of scholarships will, in some measure, reduce wastage in technical institutions by enabling indigent students to complete their courses.

16. An important problem in the field of technical education is adequate supply of text books at reasonable prices, the methods of their pro-

10. In view of the demand for personnel in specialised fields of engineering and technology for the Third Plan, new facilities were organised during the Second Plan in selected technical institutions for mining, metallurgy, chemical engineering, geo-physics, petroleum technology and industrial engineering. In addition, facilities for specialised training in town planning, architecture, printing and business management were developed. The Central School of Planning and Architecture which was set up in Delhi in close cooperation with the Institute of Town Planners will be developed and completed in the Third Plan. The four Regional Schools of Printing at Allahabad, Bombay, Calcutta and Madras with a total intake capacity of 410 students offer full time and part-time courses in different branches of printing and lithography. These will be further developed and additional facilities will be provided in the Central School of Printing to be set up in the Third Plan and at the Delhi Polytechnic.

Post-graduate Courses in industrial engineering and industrial management were started at the Indian Institute of Technology, Kharagpur, Victoria Jubilee Technical Institute, Bombay and the Indian Institute of Science, Bangalore.

Courses of Business Management are being established at several centres. It is also proposed to establish two All-India Institutes of Management.

The problems of commerce education have been recently studied by a Committee appointed by the All India Council for Technical Education with a view to assessing the present state of employment of commerce graduates and to suggest a sound and reasonably uniform system of commerce education suited to the needs and resources of our developing economy. The Committee has recommended the institution of a diploma course in commercial practice at the post-matriculation stage or after the tenth class of secondary education in polytechnics or junior commercial schools for training personnel for the intermediate grades of administration in business and commerce. The Committee has also made recommendations in respect of under-graduate and post-graduate education in commerce, provision of facilities for practical training and for business administration and management studies.

11. For training competent technicians equipped to practise the methods and techniques of industrial engineering, it is proposed to set up the National Institute for Training in Industrial Engineering.

In the Third Plan, a Central Institute of Forging and Foundry Engineering will be set up at Ranchi to train specialists in this field in association with the heavy foundry and forging plant at Ranchi where facilities are available for practical training as well as for part-time teachers.

and (vi) traditional methods of transmission of skill from one individual to another.

19. New industries now being set up require larger numbers of craftsmen who have gone through systematic training. At the end of the First Plan there were 59 training centres for craftsmen in different States under the programme sponsored by the Ministry of Labour and Employment. These provided training facilities for about 10,500 persons. By the end of the Second Plan, the number of training centres increased to 167 with a total admission capacity of 42,000. In addition, special facilities were provided for training of displaced persons. In the Third Plan additional training facilities for about 57,850 craftsmen are proposed to be established bringing the total number to about 100,000. The number of training centres for craftsmen will increase to about 318 by the end of the Third Plan. Statewise programmes of expansion of these facilities are given in the Annexure. Under the National Apprenticeship Scheme arrangements for training about 12,000 persons are expected to be made. As mentioned earlier, apprenticeship is to be placed shortly on a compulsory basis and legislation for the purpose is being introduced.

Facilities for evening classes for employed industrial workers are also to be expanded from about 2,000 at present to over 11,000 seats. A Higher National Trade Certificate Course with a duration of 6 to 12 months depending on the nature of the trade is proposed to be organised as a further stage in the training of craftsmen beyond the trade certificate courses.

20. The requirements of the Railways and Defence Establishments are being met through their own training programmes. The Railways have arrangements for training both unskilled and semi-skilled workers. Arrangements also exist for those industrial workers who have no recognised qualifications in the trades to obtain the National Trade Certificate by taking trade tests organised by the National Council for Training in Vocational Trades as private candidates. All State undertakings and a growing number of private industries have training programmes for meeting their own requirements. Facilities available in the Defence establishments are also proposed to be availed of for training craftsmen. For trades not covered by schemes mentioned above, Departments of Industries in the States will organise special training schemes under the small scale industries programme in accordance with patterns laid down by the National Council for Training in Vocational Trades. Training facilities provided by the Small Industries Service Institutes and their extension centres are to be expanded so as to meet the requirements of managerial, supervisory and extension personnel. Several Central Ministries and Departments associated with them have special in-service or practical

duction in the country and availability of foreign publications to the increasing number of students in technical institutions. Various aspects of this problem are at present being examined.

Teachers

17. The most important prerequisite for the development of technical education is the adequate supply of qualified teachers. There is at present an acute shortage of teaching personnel in engineering colleges and polytechnics. To reduce this deficit a series of measures are envisaged. The teacher training programmes both within the country and abroad which were begun in the Second Plan, will be expanded. Salary scales and general service conditions for teachers in technical institutions are being steadily improved. Schemes permitting advance recruitment of teachers and creation of supernumerary posts on the teaching staff of institutions should be enlarged. With the development of post-graduate studies in engineering and technology, larger numbers of persons with specialised and research qualifications will become available for the teaching profession. It will be desirable for institutions to enlist the help of industry in obtaining the services of practising engineers and executives for part-time teaching. Refresher courses and seminars can help in raising the quality of teaching at every level.

Training of Craftsmen

18. Industrial development not only calls for considerable increase in the numbers of skilled workers or craftsmen needed but also for a steady rise in the quality of their workmanship. There is greater emphasis on understanding of the processes involved as well as on specialised skill. The trend in various countries has, therefore, been to raise the level of general education and the minimum qualification required for entrance to a trade school. As stated earlier, during the Third Plan, about 1·3 million craftsmen will be required, about 810,000 in engineering trades and the balance in non-engineering trades. At present craftsmen or skilled workers and operatives are trained in several types of institutions and in different ways. These include (i) Industrial Training Institutes under the scheme of the Ministry of Labour and Employment, (ii) Government Departments or agencies having their own training facilities such as Defence, Railways, Posts and Telegraphs and individual public enterprises, (iii) facilities for training provided by State Departments of Industries and the Ministry of Commerce and Industry for small scale industries, (iv) Centres for training rural artisans under the community development programme, (v) numerous privately run industrial schools,

ANNEXURE

Distribution of technical institutions, by States, 1960-61 and 1965-66

	States	engineering colleges				polytechnics				industrial training institutes			
		1960-61		1965-66		1960-61		1965-66		1960-61		1965-66	
		number	admission capacity	number	admission capacity	number	admission capacity	number	admission capacity	number	admission capacity	number	admission capacity
	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Andhra Pradesh	8	1060	9**	1210	19	2473	20	2593	10	2834	18	5314
2	Assam	2	240	3	550	3	480	6	1080	6	1166	12	2966
3	Bihar	7	1346	7	1480	11	1620	16	2700	15	3932	27	11880
4	Gujarat	5	1055	6	1325	12	1610	16	2150	12	1720	18	4232
5	Jammu and Kashmir	1	120	1	120	2	240	2	240	2	328	5	1016
6	Kerala	5	580	7**	1040	11	1494	12	2044	6	2048	10	4968
7	Madhya Pradesh	7	1085	8	1385	13	1352	18	1982	8	2980	14	6020
8	Madras	12	1332	14**	2142	24	3090	27**	3790	10	2480	24	6012
9	Maharashtra	10	1545	12	2155	16	2155	22	2915	18	4210	30	10386
10	Mysore	11	1455	11	1545	24	2885	26	3245	13	2170	18	4694
11	Orissa	1	120	2	430	6	880	8	1180	7	1440	13	2512
12	Punjab	6	585	7	955	11	1480	20	2740	17	3546	32	7970
13	Rajasthan	3	405	4	770	5	760	8	1330	6	1264	17	3712
14	Uttar Pradesh	11	1152	13	1842	18	2182	31	4492	15	5904	48	16304
15	West Bengal	10	1578	12**	1878	17	2510	24	3770	11	3884	18	7896
16	Delhi	1	200	1	310	1	60	3	720	7	1684	8	3008
17	Himachal Pradesh	..	..	..	..	1	120	1	120	2	202	3	598
18	Manipur	..	..	..	..	1	60	1	60	1	96	1	184
19	Pondicherry	..	..	..	..	..	..	1	60	..	..	..	..
20	Tripura	..	..	..	..	1	120	1	180	1	248	2	312
	total	100*	13,858	117	19,137	196*	25,571	263	37,391	167	42,136	318	99,984

NOTE: All-India institutions like the Institutes of Technology are shown under States in which they are situated.
*Includes all institutions which were started by 1960-61.
**Includes private institutions likely to be set up during the Third Plan.

training programmes. Among these, mention may be made of the National Laboratories, the Atomic Energy Establishment, Ministry of Irrigation and Power, the India Meteorological Department and the All India Radio. Besides, the training programmes of the All India Boards for small scale industries, coir, silk, handloom and handicraft and those of Khadi and Village Industries Commission provide for the training of skilled and semi-skilled workers required in their respective fields. Training programmes for craftsmen are to be coordinated and their effective use provided through the National Council for Training in Vocational Trades.

21. For the training of craft instructors in vocational trades for programmes for training craftsmen in Industrial Training Institutes and elsewhere, three Central Training Institutes had been set up by the end of the Second Plan at Calcutta, Bombay and Kanpur. These bring the total admission capacity to over 500. In addition, for the training of women instructors there is a Central Training Institute at Delhi. In the Third Plan, these Institutes will be expanded to an admission capacity of over 1000 seats. In addition, three new institutes are to be established at Madras, Hyderabad and Ludhiana, so that at the end of the Third Plan there would be about 1800 seats for training instructors in different trades. The out-turn from these institutes during the Third Plan is estimated at about 7800.

resources for research in the more advanced countries. Industry supports research and in turn research advances industry and a symbiotic process is established. In India the contribution of industry towards scientific research is not at present commensurate with the progress of the economy and the vast opportunities opened up through planned development. Nevertheless, successive Five Year Plans have made steadily increasing allotments for scientific research. Through improvement in agriculture, medical and health facilities, techniques of locating and processing raw materials, providing substitutes and evolving new materials, appliances and techniques for industry, transport, power, communications and other essential utilities, investment in research yields a return many times over. Research will progressively reduce the burden of imports required for the maintenance of existing enterprises and establishment of new enterprises, facilitate exports and advance technical skills and know-how.

5. *Aims of Scientific Policy*.—The aims of India's scientific policy were set forth in Scientific Policy Resolution of March, 1958, in the following terms:

(i) to foster, promote, and sustain, by all appropriate means, the cultivation of science and scientific research in all its aspects—pure, applied and educational;

(ii) to ensure an adequate supply, within the country, of research scientists of the highest quality, and to recognise their work as an important component of the strength of the nation;

(iii) to encourage, and initiate, with all possible speed, programmes for the training of scientific and technical personnel, on a scale adequate to fulfil the country's needs in science and education, agriculture and industry, and defence;

(iv) to ensure that the creative talent of men and women is encouraged and finds full scope in scientific activity;

(v) to encourage individual initiative for the acquisition and dissemination of knowledge, and the discovery of new knowledge, in an atmosphere of academic freedom; and in general,

(vi) to ensure for the people of the country all the benefits that can accrue from the acquisition and application of scientific knowledge.

With the object of fulfilling these aims Government decided to offer good conditions of service to scientists, associate them with the formulation of policies and give them an honoured place in national life.

6. *Research programmes*.—In the First Five Year Plan attention was chiefly devoted to the building up of national laboratories and other research institutions. In the Second Plan the available facilities were developed, research was made more broad-based and research facilities in

CHAPTER XXXI

SCIENTIFIC AND TECHNOLOGICAL RESEARCH

I

ROLE OF SCIENTIFIC RESEARCH

SCIENTIFIC and technological research makes a fundamental contribution to the development of a country. It has created better and more abundant crops, improved the health of people by cure and prevention of disease and provided speedier and better transport facilities by land, water and air and also more and diversified employment for the people. Atoms-for-peace and space exploration are its latest challenges.

2. High standards of living in the more advanced countries are the direct result of progress in science and technology and the rapid pace of development associated with it. The flow of new scientific knowledge is continuous and ever expanding and covers both pure and applied research. Pure research leads to new knowledge and understanding of nature and its laws, and creates the scientific capital from which practical applications of knowledge are drawn. New products and processes are based on new principles and conceptions. The advance of technology presents new problems to science and also provides new tools with which to resolve them.

3. Since the Second World War, the pace of scientific and technological research in more advanced countries has greatly increased. In the economy of these countries, scientific research has an important and honoured place and receives every encouragement. As the field of enquiry and investigation widens, larger funds are invested, there is intensive search for scientific talent, the number and quality of research workers improves, the pace of research is accelerated, and results are achieved with greater speed. One of the results of this activity in the more advanced countries, however, has been that the gap between the advanced and less advanced countries tends to become ever larger. The task before India is to cover this distance by putting in the utmost effort in the development of scientific and technological research, and in the application of science in the furtherance of her development programmes.

4. Investment in scientific research makes a large and enduring contribution to the prosperity of the country. As an instance, the remarkable development in the production of sugar and cotton in India may be mentioned, which is largely due to the application of the techniques of plant breeding. Apart from Government, it is industry which provides large

Medical research is supported mainly by the Indian Council of Medical Research which coordinates and sponsors research schemes in a large number of centres.

Agricultural research is coordinated and sponsored by the Indian Council of Agricultural Research and the Commodity Committees and is undertaken at a large number of institutes and research stations maintained by the Central and State Governments.

Research and development work relating to atomic energy and isotopes is being conducted under the direction of the Department of Atomic Energy at the Atomic Energy Establishment, Trombay and under the Department's programme of nuclear research.

8. *Resources for scientific and technological research.*—Development expenditure in scientific and technological research and outlays for programmes in the Third Plan under the Central Government are shown in the following Table:

(Rs. crores)

	Second Plan estimated expenditure	Third Plan
Council of Scientific and Industrial Research (C.S.I.R.) (including large scale field experiment) and Ministry of Scientific Research and Cultural Affairs	20·00	35.00
Department of Atomic Energy	27·00	35·00
agricultural research	13.80	26.40
medical research	2.20	3 50
research under other Central Ministries (other than Defence)	9.00	30.89
total	72.00	130.00

The Third Plan outlays are in addition to expenditure amounting to Rs. 75 crores over the five year period on the continuance of facilities established upto the end of the Second Plan.

9. The progress of scientific and technological research over the first two Plan periods and the programmes formulated for the Third Plan are reviewed below under the following heads:

(i) Council of Scientific and Industrial Research,

(ii) Ministry of Scientific Research,

(iii) Department of Atomic Energy,

(iv) research in agriculture and allied fields,

(v) medical research,

universities and at other research centres were further extended. In the Third Plan the programme of scientific and technological research will be devoted specially to—

(i) strengthening the existing research institutions and expanding facilities for research over a wide field;

(ii) encouraging basic research in universities;

(iii) encouraging, in particular, research in engineering and technology;

(iv) training of research personnel and expanding the programme of research fellowships and scholarships;

(v) carrying out research in the development and manufacture of scientific and industrial instruments;

(vi) coordination of research work carried out in national laboratories, universities, technical institutions, laboratories of scientific associations and research wings of Government Departments; and

(vii) utilising results of research after establishing their validity through pilot plant production, full scale field experiments, etc.

7. As a result of developments over the first two Plans an extensive network of institutions engaged in scientific research has come into existence and pure research, applied research and research in specialised fields are being undertaken at a large number of centres.

Research in pure sciences is being carried out mainly in the universities and in laboratories run by scientific societies and associations. The Council of Scientific and Industrial Research and the Department of Atomic Energy encourage fundamental research in their own laboratories as well as in universities and in other institutions all over the country.

Applied and industrial research is being undertaken by national laboratories, cooperative industrial research associations and in a small number of industrial undertakings.

Research in engineering subjects is being pursued in some of the national laboratories, in institutes of technology, in engineering colleges associated with universities, and in research agencies of Government Departments concerned with roads, railways, buildings, irrigation, power, communications, aviation, etc.

Research in mineral sciences is being undertaken by the Indian Bureau of Mines, Geological Survey of India, National Metallurgical Laboratory, Central Fuel Research Institute, Central Mining Research Station and the Oil and Natural Gas Commission.

steel and coinage alloys, setting up of a low shaft furnace for production of iron from low grade ores and non-metallurgical coal on a pilot plant scale, multipurpose food, protein supplement food based on oil cakes and cereals, baby foods based on skimmed buffalo milk, dried fruit pulps, production of nicotine sulphate from tobacco waste, polyoses from tamarin seeds, ion exchange resins from cashew nut shell liquid, decolorising and de-ionising carbons from low grade coal, building boards based on sawdust and other ligno-cellulosic waste, ceramic condensers, development of an automatic eletronic traffic control device and group hearing aid for deaf children. Methods have also been developed for upgrading coal, manganese ores, and other minerals.

13. In addition to the national laboratories, the C.S.I.R. has established a number of research centres and units all over the country. There are about five research centres on essential oils for developing cultivation of essential oil-bearing plants, a Rain and Clouds Physics Research Unit and a Public Health Engineering Research Centre at Chandrawal Water Works, Delhi. Research centres have also been set up for gas turbines, wind power, medicinal plants, earthquake engineering, etc.

14. The C.S.I.R. also sponsors research schemes at various universities and institutes and provides grants-in-aid for specific research schemes. The grants are given on the advice of 13 research committees of the C.S.I.R. which deal with different subjects. Universities, research institutes, industry and the Government Departments concerned are represented on these committees. During 1960-61, more than 360 research schemes were sponsored at 90 different centres.

15. A National Register Unit in the Council of Scientific and Industrial Research maintains up-to-date information regarding scientific and technical personnel in the country as well as a separate roster for Indian scientists receiving training abroad.

The Council of Scientific and Industrial Research has instituted a scheme for junior and senior research fellowships, which are tenable at the national laboratories as well as at universities and other institutions.

The Council of Scientific and Industrial Research maintains a Scientists' Pool which provides temporary placement to scientists returning to India after training abroad and assigns to them suitable work until they can secure opportunities in their own lines of specialisation. The strength of the Scientists' Pool has been recently raised from 100 to 200.

A scheme for providing financial assistance to retired research scientists to enable them to continue active research was instituted in 1958.

16. *Industrial research.*—It has been the policy of the C.S.I.R. to encourage research on problems of industries by cooperative research

(vi) other programmes of research:

(a) irrigation and power,

(b) transport and construction,

(c) minerals,

(d) communication,

(vii) sugar, jute and other industries,

(viii) research in universities and institutes of higher technology (including engineering research and statistics),

(ix) utilisation of scientific research,

(x) scientific instruments, and

(xi) standardisation, quality control and productivity.

II

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

10. *Review of progress.*—The Council of Scientific and Industrial Research undertakes research in its own laboratories and institutions, and also by way of sponsored research schemes in universities and other research institutions.

11. There are at present 23 national and regional laboratories which are mainly carrying on applied research. New laboratories started during the Second Plan include the Central Mechanical Engineering Research Institute, the Central Public Health Engineering Research Institute, National Aeronautical Laboratory and the Regional Research Laboratory, Assam. In addition, three existing laboratories namely, the Indian Institute for Biochemistry and Experimental Medicine, the Regional Research Laboratory, Hyderabad, and the Regional Research Laboratory, Jammu have been taken over by the Council of Scientific and Industrial Research. The Birla Industrial and Technological Museum has been established at Calcutta. The Council has also established the Central Indian Medical Plants Organisation for promoting cultivation of medicinal plants and the Central Scientific Instruments Organisation for developing the manufacture of scientific instruments.

12. At the national laboratories, surveys and assessment of raw materials have been undertaken and indigenous substitutes for scarce or imported raw materials have been developed. Improvements in manufacturing methods have been brought about and a range of new products have been developed. In this connection special mention may be made of the production of mica insulating bricks utilising waste mica, optical glass from indigenous raw materials, development of nickel-free stainless

Nagpur, the National Aeronautical Laboratory at Bangalore, the Regional Research Laboratory in Assam, the Central Indian Medicinal Plants Organisation and the Central Scientific Instruments Organisation. These institutions will be fully equipped in the course of the Third Plan.

18. *New research institutions in the Third Plan.*—A number of new institutions and research centres are proposed to be established in the Third Plan. These include, amongst others, the Institute of Petroleum, the National Biological Laboratory and a Regional Research Laboratory.

The Institute of Petroleum for research on petroleum and its products is being established at Dehra Dun.

It is proposed to set up a National Biological Laboratory with Division for physiology, cytology and genetics, experimental embryology, microbiology, virology and immunology, biophysics and biometry, and biochemistry.

It is proposed to establish a Fire Research Station along with the Bombay regional unit of the Central Buildings Research Institute, Roorkee. The Station will undertake research on fire problems and will advise on problems relating to fires and fire protection.

For studying the effects of earthquakes on structures and for designing earthquake-proof constructions, the Earthquake Engineering Research Centre, set up during the Second Plan at Roorkee, is to be strengthened.

The pilot plant of the Low Shaft Furnace Project established at the National Metallurgical Laboratory, Jamshedpur, to carry out trials for the production of iron without using coking coal, will be expanded to include the production of ferro-alloys. The scope of the project will also be extended to utilise the low shaft furnace gas for upgrading low-grade manganese ores and for the production of sponge iron.

Proposals to establish during the Third Plan cooperative research associations for automobiles, cement, foundry, printing, food and allied industries are being examined.

III

MINISTRY OF SCIENTIFIC RESEARCH

19. The Ministry of Scientific Research is responsible for the development of several research organisations, such as the Survey of India, the National Atlas Organisation, the Botanical and Zoological Surveys and the Central Board of Geophysics and also makes grants for scientific research.

20. *Surveys of India.*—During the First and Second Plan periods 1·66 lakh sq. miles of the country were covered by departmental surveys on standard scales. In addition, demarcation of the boundry between West

associations established by industries themselves. Thus, the Council has supported cooperative research units set up by the silk and art silk, rubber and paint industries and by the Textile Research Associations at Ahmedabad, Bombay and Coimbatore.

The national laboratories have endeavoured to assist various industries through provision of technical advice and testing facilities and investigations relating to substitute raw materials, etc. Contacts are maintained with industrial associations, Chambers of Commerce and technical departments of the Central and State Governments with a view to indentifying problems and referring them to the appropriate national laboratories for further study. Industrial liaison offices have also been established for keeping in touch with the industry.

17. *Programmes of national laboratories.*—Each national laboratory has reviewed its work and drawn up a programme of development for the Third Plan. A few leading items in these programmes may be briefly mentioned. The National Physical Laboratory will undertake development of radio components on a pilot plant scale. The National Chemical Laboratory proposes to set up new Divisions for dyes and inorganic intermediates and essential oils and will undertake a number of new pilot plant projects. The National Metallurgical Laboratory will establish a new Division for alloy steels as also to study problems of corrosion under different conditions. The Central Fuel Research Institute will extend its work on the utilisation of low grade coals and will initiate large scale pilot plant trials. The Glass and Ceramic Institute will have a pilot plant for the production of optical glass and a separate wing for research in mica products. The Central Drug Research Laboratory will start a Division for antibiotics and fine chemicals. The Central Food Technological Research Institute will establish regional fruit and vegetable preservation stations. The Central Road Research Institute will set up a new Division for the study of problems relating to bridges. The Central Building Research Institute proposes to start five regional research units. Regional extension centres will also be set up by the Central Leather Research Institute. The Central Electro-Chemical Research Institute will have new Divisions for research on corrosion and chemical physics. The Central Salt Research Institute will undertake work on algology and will also initiate pilot projects for the recovery of by-products from salt bitterns.

The Indian National Scientific Documentation Centre (INSDOC) will be expanded to serve as a national clearing house for scientific and technical information.

Among the institutions begun during the Second Plan reference may be made to the Central Mechanical Engineering Research Institute at Durgapur, the Central Public Health Engineering Research Institute at

Research Wing is concerned with various aspects of geophysical exploration and instrumentation.

The Oceanographic Research Wing will collect oceanographic data over extensive areas in the Arabian Sea and Bay of Bengal. It will also participate in the International Indian Ocean Expeditions (1960-64).

25. *Assistance for scientific societies and associations.*—Scientific societies and associations maintain research institutions of their own and offer scholarships and fellowships to promising young scientists. In the Second Plan, the Ministry of Scientific Research provided about Rs. 2 crores as grants-in-aid to scientific societies and associations. Among the organisations which have been assisted are the National Institute of Sciences of India, the Indian Science Congress Association, the Indian Association for Cultivation of Science, the Bose Institute, the Indian Academy of Sciences (Raman Institute), the Physical Research Laboratory (Ahmedabad) and the Birbal Sahni Institute of Palaeobotany. Assistance is also given to a number of other learned scientific societies in fields such as physics, chemistry, mathematics, botany, zoology, geology, mining and engineering.

26. During recent years there has been a new interest in the country in mountaineering and striking advances have been made since the establishment of the Himalayan Mountaineering Institute at Darjeeling. During the Third Plan mountaineering research and expeditions will be given the support needed.

At the end of the Second Plan a Himalayan Zoological Park was established at Darjeeling. It will be developed further during the Third Plan.

27. *Vijnan Mandirs.*—The object of the Vijnan Mandir scheme (rural science laboratories) was to create popular interest in scientific development, disseminate scientific information and bring application of science closer to the everyday life of the rural population. By the end of the Second Plan 39 Vijnan Mandirs were set up. The working of the scheme has been reviewed by a committee which has suggested that Vijnan Mandirs should function in close cooperation with educational institutions and popular organisations in areas served by the community development programme and that their administration should be taken over by State Governments. These proposals are under consideration. Tentatively, it is envisaged that 160 additional Vijnan Mandirs should be set up in the Third Plan.

IV

DEPARTMENT OF ATOMIC ENERGY

28. The principal aims of the Department of Atomic Energy are to develop the use of atomic energy for the production of electrical power, and to develop its uses in agriculture, biology, industry and medicine

Pakistan and India was largely completed. Surveys covering about 110,000 sq. miles in connection with more than 150 river valley, flood control and industrial projects were completed by the Survey of India. Surveys by photogrammetric methods have also been introduced. The Survey of India participated in observations under the programme of the International Geophysical Year. To cope with heavy demands for surveys and mapping for projects under the Five Year Plans, the Survey of India has undertaken a scheme of expansion, mechanisation and modernisation. During the Third Plan the Survey of India proposes to set up separate research cells for cartography, geodesy and photogrammetry.

21. *National Atlas Organisation.*—The National Atlas Organisation, which was sanctioned in 1956, has a large programme of work in hand. It has produced a preliminary edition of the National Atlas of India in Hindi and is engaged in the preparation of the main edition. The Organisation proposes to bring out maps in the form of fascicules in respect of various topics, such as population, physical, transport, etc.

22. *Botanical Survey of India.*—The Botanical Survey of India has formulated a programme of development for the Third Plan which includes the setting up of Divisions for economic botany and medicinal plants, a national cryptogamic collection which will include marine and fresh water flora, a central pool for wood, pollen, fossil and corpological collection and experimental gardens in different climatic regions. It is also proposed to develop further the Indian Council of Ecological Research so that problems relating to desert control, flood control, soil conservation and wild-life management may receive further attention. The Botanical Survey proposes to constitute two new Circles in the Third Plan. One of these will be concerned with the problems of the arid zone.

23. *Zoological Survey of India.*—During the Second Plan important faunistic surveys were undertaken by the Zoological Survey. These included the Rajasthan desert survey, Sambhar Lake survey and Pondicherry-Karaikal surveys. Several thousand specimens were collected, studied, identified and added to the national zoological collections. Development schemes of the Zoological Survey for the Third Plan include the establishment of new Divisions for ecology and wild life conservation and palaeozoology and of two new field stations for conducting research work on fresh water and high altitude biology. The Marine Survey Unit will also be expanded.

24. *Central Board of Geophysics.*—The Geophysical Research Wing and the Oceanographic Research Wing which were started by the Central Board of Geophysics during the Second Plan period are still in their initial stages. The Council of Scientific and Industrial Research will take them over from the beginning of the Third Plan. The Geophysical

tion to produce the control system for any reactor including a nuclear power station.

The Technical Physics Section is engaged in developing and making instruments which have been imported hitherto. Several different types of mass spectrometers as well as other instruments have been designed and produced.

30. The Chemical Group consists of Divisions for Analytical Chemistry, Isotopes, Radio-chemistry, and Chemical Engineering and a Remote Handling Section. This Group has developed techniques for detecting minute quantities of impurities in atomically pure material; for example, boron can be detected to a tenth of a part per million in graphite. Techniques for the production and handling of radioisotopes and for handling and treating highly radio-active substances such as radio-iodine, radio-phosphorus, radio-gold, radio-sodium, radio-iron, etc. have been developed for facilitating their use for research or in therapy. Important work has been done on studying the chemical properties of plutonium and the rare earths for developing industrial processes for separation of plutonium and rare earths from used fuel elements. Research and development work has been done for producing atomically pure uranium from crude uranium salt and on the basis of this work a pilot plant has been successfully designed and built and has been in operation since April, 1959. This plant has produced the uranium which fuels Zerlina and the Canada-India Reactor. Processes and flowsheets have been worked out for the uranium mill to be set up in Bihar for the extraction of uranium from uranium ore. A process has been developed for the extraction of minute amounts of uranium from waste copper tailings and is being tried out on a pilot plant scale. Pilot plants for making stable isotopes such as nitrogen 14 have been set up. Considerable work is being done on different methods of making heavy water and on upgrading heavy water which becomes downgraded in the course of operation of atomic reactors. Basic research concerned with developing uranium, thorium and other alloys of importance in atomic energy work, is being carried out in the Metallurgy Division. The Division has been responsible for designing, building and operating a facility for the production of elements. The establishment of uranium metal and fuel fabrication plants has placed India among the few countries which produce their own fuel elements.

31. The Engineering Group consists of three Divisions, namely, Reactor Engineering, Reactor Operations and Engineering Service, and is concerned with engineering problems relating to the design, construction and operation of atomic reactors. It has designed and built seven "loops" for studying the behaviour of materials used in reactors. The Group was responsible for the mechanical and engineering design of Apsara and Zerlina.

through a widespread use of isotopes as tracers in scientific investigations and as sources of radiation. Since India has the largest deposits of thorium in the world, the ultimate aim is to base nuclear power production in the country on thorium, a task which will require long range research and the solution of many difficult technological problems in physics, chemistry, metallurgy and engineering.

29. *Atomic Energy Establishment.*—The principal centre for scientific research and technical development work in the field of atomic energy is the Atomic Energy Establishment at Trombay which was inaugurated in January, 1957. It has at present on its staff over 1300 graduate scientists and engineers who have been given advanced on-the-job training in the Establishment. The work of the Establishment is organised in some 15 Divisions covering scientific disciplines such as physics, chemistry, biology, medicine, engineering and metallurgy.

The Physics Group comprises the Nuclear Physics, Health Physics and Electronics Division and the Technical Physics Section. The Nuclear Physics Division is doing important work on the diffusion and slowing down of neutrons in various materials, which is necessary for an understanding of basic physical phenomena in solids as also in the design of nuclear reactors. Work on neutron scattering and other nuclear reactions is being undertaken.

The Air Monitoring Section of the Health Physics Division not only monitors the air at several important places in the neighbourhood of the Trombay Establishment but also has established 34 centres in different parts of the country for undertaking systematic survey of radio-active content of air, rain-water and milk, thus enabling a check to be kept on fall-out due to atomic explosions. Measurements are also carried out on the radio-active content of vegetation especially in the neighbourhood of Bombay and also of the strontium absorbed in bones, in animals and human beings, due to ingestion of radio-strontium arising from atomic fall-out.

The Radiation Measurement Section of the Health Physics Division runs a film badge service for all workers dealing with radiation and radio-active substances in the Trombay Establishment, and also on a voluntary basis for hospitals and research institutions in the country.

The Electronics Division has developed almost all the electronic instruments used in the Atomic Energy Establishment and for the survey of radio-active minerals. The programme of production is being expanded to meet the country's entire requirements of electronic instruments for the Third Plan. The control systems for Apsara and Zerlina Reactors were developed by the Reactor Control Section which is now in a posi-

a Modular Laboratory for housing the Divisions which will handle only small quantities of radioactive material and a large Radiological Laboratory for high activity work with hot cells, in which hundred thousand curie amounts can be handled, as will be necessary for the Isotope and Radiochemistry Divisions, and the plutonium laboratory.

36. Some of the more important developments envisaged in the Third Plan may be briefly mentioned. The film badge service of the Health Physics Division will be extended to cover all institutions in the country using radioactive materials or radiation.

The Electronics Division will expand its work on design and production of electronic instruments. The Division has also taken up the development and manufacture of transistors.

A plant for the treatment of used fuel elements and the extraction of plutonium is under construction at Trombay, and will be completed in the first half of 1963. The plant is also designed to treat uranium fuel elements enriched upto about 2 per cent, and will provide the experience necessary for the construction of the plutonium plant proposed for the Third Plan. Extensive waste disposal facilities are an essential part of a large atomic energy establishment, and a waste treatment plant for high active waste is being designed in conjunction with the plutonium plant. A plant for treating low active waste will be constructed next to the Canada–India Reactor.

Processes for the production of zirconium, beryllium, and other metals required in an atomic energy programme have already been developed during the Second Plan. These will be tried out on a pilot plant scale.

37. The Isotope Division will increase its production of radio-isotopes, such as, phosphorus 32, sulphur 35, chromium 51, iron 59, bromine 82, iodine 131, and gold 198, so as to be able to supply the needs of the entire country. In addition, the production of labelled organic compounds necessary for biological investigations, which has already been initiated, will be greatly expanded.

The production of large quantities of cobalt 60 for medical therapy will be established, so that this radiation source, so valuable in the treatment of cancer, can be supplied to many more hospitals in the country than at present.

A Medical Isotope Centre will be set up which will provide for the use of isotopes in medical research and therapy, and for the training of doctors from all over the country in the use of these new tools.

The Biology Division and the Medical Division will be greatly augmented with increased effort on the study of cancer, chemical mutagens, and anti-cancer agents. The construction of a gamma field at Trombay

Apsara became critical on August 4, 1956, and gave continuous and trouble-free operation for four years till it was shut down on August 4, 1960, for maintenance, repairs and renovation. This reactor has operated for 2·2 million kWh in four years and has produced most of the radioisotopes made in India and has also been a valuable tool for experiments in physics. It has been in operation again since January, 1961, with an improved control and cooling system. Zerlina went into operation on January 15, 1961. The Canada-India Reactor is a high flux, natural uranium fuelled, heavy water moderated, light water cooled reactor, which first became critical on June 15, 1960. This is a power-fuel reactor for engineering research and provides a necessary facility for the design of nuclear power stations. It is also one of the largest potential isotope producers and will make India self-sufficient in pile-produced isotopes, including specially those used for medical purposes like radio-cobalt.

32. The Biology and Medical Divisions have done important work on the effects of radiation on biological organisms especially at the cellular level.

33. The Tata Institute for Fundamental Research, which was established in 1945, is the leading centre for advanced study and fundamental research in nuclear science and mathematics. Research work done by this Institute in theoretical physics in the field of elementary particles, its experimental work in cosmic rays, geophysics, nuclear physics and its school of mathematics have received wide recognition. The fundamental work in mathematics, cosmic rays, geophysics and nuclear physics will be developed further. It is proposed to instal one of the latest types of fast transistorised digital computers in the Institute. It is also planned to design and build a computer with a higher speed and more powerful computational facilities than any commercially available today. A charged particle accelerator for high energy nuclear physics work is also under consideration.

34. The Department of Atomic Energy has a large Atomic Minerals Division whose function is to find new deposits of minerals of use in an atomic energy programme. Thorium deposits containing nearly 300,000 tons of thorium in a concentration of 10 per cent were discovered in Bihar. A number of finds, which are in the process of being proved by drilling have also been made in the country. One of the deposits in Bihar contains several thousands tons of uranium. India has also important deposits of beryl, zircon, and other minerals of importance in the atomic energy programme.

35. *Programmes in the Third Plan.*—During the Third Plan the Atomic Energy Establishment will intensify and broaden the scope of activities which have been described above. The present temporary laboratories will be replaced by new laboratories. These will include, in particular,

Research on local problems is carried on at a large number of research stations which are assisted by the Indian Council of Agricultural Research and Commodity Committees for Cotton, Jute, Oilseeds, Tobacco, Sugarcane, Arecanut, Coconut and Lac. Research on plantation crops is sponsored by the Tea, Coffee and Rubber Boards. The Indian Council of Agricultural Research and the Commodity Committees also assist for coordinated research projects of a regional or all-India character. An important development in the Second Five Year Plan is the setting up of 17 composite research stations on cotton, oilseeds and millets. The establishment of these research stations has provided a coverage for fundamental research applicable to a wide range of agro-climatic conditions. Research on soil conservation problems is undertaken under the auspices of the Central Soil Conservation Board.

42. *Agriculture.*—Over the past decade agricultural research has contributed to improvement in crop production in several direction. Among these mention may be made of the development of rust resistant wheats at the Indian Agricultural Research Institute. One of these wheats was produced using atomic energy as a source for inducing mutations. During the First and Second Plans research has been undertaken in the breeding of high yielding varieties of rice, introduction of new varieties, improvement of hill paddy, and evolution of rice varieties resistant to disease. Fundamental studies on the physiology of rice plants have also been carried out. In respect of millets, the technique of hybridisation is being extended to jowar and bajra with a view to evolving high yielding varieties. At a number of stations improved agronomic practices relating to millets are also under study. In the field of cotton research, the acclimatization of sea island cotton of Andrews variety in Kerala is a significant development. Extra long staple cottons have been evolved in Madras and Punjab and recommended for commercial cultivation. A large programme of hybrid maize seed production has been taken in hand. Several improved varieties of subsidiary food crops like tapioca and potato, vegetables such as tomato and brinjal, and fruits like grapes and papaya, and of pulses and oilseeds have been evolved. Dosage rates of fertilisers for different crops and their water requirements have been worked out. Work on weed control and control of diseases and pests by chemical spray has yielded useful results.

43. For the Third Plan, the Indian Council of Agricultural Research has a programme for enlarging facilities for research in the States through expansion of the existing agricultural institutes and by the setting up of experimental stations in different regions based on soil and climate. Rice research stations with sub-stations will be set up in each rice growing State. Research on wheat rust control and other coordinated agronomic experiments and research on hybrid maize will be extended. Cross-commodity stations for research on millets, cotton and oilseeds will also be

for using radiation to study and produce plant mutations and to develop species with better characteristics will be completed.

Work on preservation of food by radiation and on sterilisation by radiation of such articles as bandages, medical equipment, etc. will also be taken up.

38. A study is being carried out of the cost of a 200 MW nuclear power station of Canadian type using heavy water as moderator and organic as coolant.

Work on a 20 MW prototype nuclear power station using natural uranium as fuel, heavy water as moderator, and organic as coolant will be carried further.

39. The high altitude laboratory at Gulmarg will be completed and connected by a wire ropeway to a higher station at Khilanmarg and Apharwat. These laboratories will be used immediately for high altitude research in cosmic rays, but will also be available for high altitude research in biology, physiology, and other sciences.

It is also planned to set up a high altitude laboratory at Kodaikanal in South India on the magnetic equator at an altitude of nearly 8000 feet.

40. The Atomic Energy Establishment, in cooperation with the Tata Institute of Fundamental Research, maintains a training school to which some 200 post-graduate students are admitted every year from universities all over the country. In the Third Plan, the training school will provide for facilities for a larger number of post-graduate scientists from Indian universities as well as for a limited number of scientists from other countries. The Department of Atomic Energy has instituted a scheme for the award of 120 scholarships every year to under-graduate and post-graduate students in the universities with a view to encouraging bright students to take up scientific careers.

The Department proposes to set up two inter-university centres—one in the north and another in the south—for providing scientists in universities with research facilities requiring the use of experimental reactors and other large expensive equipment.

V

Research in Agriculture and Allied Fields

41. Agricultural research is carried on in Central research institutes as well as at research stations in the States. Besides the Indian Agricultural Research Institute, Delhi, the Forest Research Institute, Dehra Dun, the Indian Veterinary Research Institute, Izatnagar and the National Dairy Research Institute at Karnal, fundamental studies and research are undertaken at Central Research Institutes for rice, potato and fisheries

Research programmes in soil conservation will include both applied and fundamental studies. Among the former may be mentioned studies of the various aspects of soil, agronomic studies concerned with cultivation and crop rotation, mixed cropping, strip cropping, trials with green manuring crops, cultivation of horticultural crops in the slopes of hills, agrostological studies on various grasses for erosion control and pasture management, studies of afforestation, regeneration and water-shed management, engineering studies on different cross sections, grades and lengths of control bunds and bench terraces, reclamation of gullies by different types of check dams, construction of earth dams and studies of various aspects of desert land and of the economics of soil conservation measures. The fundamental studies will include investigations on basic laws governing hydrological behaviour of water-sheds under various management practices and basic soil investigations in relation to soil and water conservation.

48. *Animal husbandry*.—Research in animal husbandry has covered various aspects of breeding, feeding and disease control. At a large number of centres, research which has been undertaken under field conditions concerning cross-breeding of non-descript cattle in hilly and high rainfall areas has shown that under these conditions there is improvement in milk-yield in the progeny. A coordinated research scheme on the merits of selective breeding of certain local types of cattle as against their grading up with well defined breeds of greater productive capacity has been initiated. Research on artificial insemination has provided a powerful tool in the hands of breeders in improving the breeds.

Besides research on animal nutrition at Izatnagar, regional animal nutrition stations have been established. These have facilitated studies in the chemical composition and nutritive value of available foodstuffs in different regions and for detecting and correcting nutritional deficiencies. Research on the improvement of the nutritive value of paddy straw, which forms the bulk of nutrition for cattle in the country, has shown simple methods of treatment which can be resorted to for removing deleterious effects caused by feeding paddy straw. Work has also been done on the feeding value of certain fodders and tree leaves that can be made use of during scarcity or famine periods.

Investigations on animal diseases have been carried out on an extensive scale. Useful results have been secured regarding the causative factors of certain diseases and their treatment and prevention. Research on rinderpest has led to the development of the freeze-dried goat tissue vaccine which is now being used for immunising comparatively resistant cattle of the plains and development of the lapinised and lapinised-avinised vaccine for immunising the more susceptible hill cattle. A vaccine was also evolved for immunisation against pasteurellosis.

49. In the Third Plan, the Indian Council of Agricultural Research will continue many of the current schemes of research on different aspects

expanded. Agricultural research centres will be established in each major river valley project area and agronomic surveys of those areas will be undertaken. It is proposed to establish new Institutes for fertiliser technology, forage and grasslands research, research on soils and plant virology. Research on fruits, spices, cashewnut and cocoa will be expanded. Regional stations for research on tuber crops other than potato will be set up. A national hortorium will be established to serve as repository of all introduced plants in India. Facilities for research, improvement and testing of agricultural implements will also be developed on a considerable scale.

44. All the Divisions of the Indian Agricultural Research Institute will be expanded during the Third Plan. Several superior hybrids and synthetic varieties in maize and the major millets are to be developed. Mutation inducing methods using radioisotopes and chemical mutagens will be further exploited for crop improvement. Facilities of the artificial climate house (phytotron) will be developed and utilised for studies in plant physiology and plant improvement. Research on soil physics will be intensified. A section on plant nematology is to be started for research on nematodes causing causing damage to agricultural crops. Work on insect pests with reference to their genetics and resistance of plants to insects will be expanded. Other additions will be a tillage laboratory and a hydraulics and general engineering laboratory.

45. Research on various commodities under the various Commodity Committees will generally aim at increasing yield and improving quality. Breeding work on different crops for obtaining high yielding varieties resistant to diseases will be developed further. Technological research on cotton, jute, tobacco, etc. will aim at improvement in the methods of processing, packing and manufacture. In the case of jute and lac, the effort will be to evolve new uses. Emphasis will also be laid on the utilisation of by-products such as coconut husks, jute sticks, coir, tobacco wastes, lac wastes, cotton wastes, cotton seed hulls, etc.

46. Work relating to agro-economic research initiated during the first two Plans at the Agro-Economic Research Centres started by the Ministry of Food and Agriculture will be further intensified. It is also proposed to extend farm management studies to cover selected regions in all States.

47. *Soil conservation.*—The main soil conservation problems in India have been classified region-wise and a number of research programmes have been initiated. In addition to the existing Research-cum-Demonstration and Training Centres, two more research centres for red soil areas will be established during the Third Plan one in Orissa representing high rainfall areas, and the other in Andhra Pradesh representing low rainfall areas.

designing several important dairy development schemes. Improved methods for making ghee have been evolved and a new method of detecting adulteration in milk has been established.

New studies on evolving new breeds of dairy cattle by cross-breeding indigenous cows with Jersey bulls and grading up Kangayam breed of cattle with Tharparkar will be undertaken. Research on the comparative economics of specialised dairy farming versus arable farming versus mixed farming will be further intensified. Studies designed to reduce the cost of maturity of calves by feeding with milk substitutes will be undertaken. Problems of storage and transport of large quantities of milk and processing of high acid cream for making butter, etc. will be investigated. Investigations are also contemplated on mineral metabolism in ruminants with the aid of radioactive isotopes.

National Dairy Research Institute will initiate research on nutritional physiology of different breeds of cattle, pasture management, growth rate of calves, studies on problems relating to technological aspects of bulk milk processing, handling and distribution, as also studies on manufacture, packaging and storage of milk products. Research on dairy utensils, bacteriology of milk and milk products, residual antibiotics, regional compositions of milk, detection of adulteration, keeping quality and mineral balance of milk will be taken up. A new Division on dietetics will be set up for research on nutritive aspects of milk and milk products.

53. *Forest research.*—Many of the research schemes sanctioned at the Forest Research Institute, Dehra Dun, during the Second Plan will continue during the Third Plan. These include studies on plant genetics of forest trees, forest influences, epidemiology of forest insects and pests, protection of timber against marine borers, preservation of green bamboos, introduction of Malayan cane in India, coordination of silvicultural research in the States, volume and yield table for Indian timbers and others. In addition, new research schemes will also be taken up during the Third Plan, such as studies on forest soils, ecology of forest life, grazing and fodder research, and research on the utilisation of the barks of Indian trees. It is also proposed to establish several regional research centres, a biological wing at Jabalpur and a utilisation wing at Nagpur. The research centres at Bangalore and Coimbatore will be strengthened.

54. *Fisheries.*—At the Central Marine Fisheries Research Station, Mandapam, research schemes on the productivity of Indian seas, oceanographic studies in relation to fisheries, molluscan fisheries, fish food availability, etc. will be continued. New schemes to be taken up will include specific studies on mackerels, sardines, prawns, etc.

of animal husbandry. Pilot investigations on cross-breeding of indigenous cattle in areas of heavy rainfall and high altitude will be continued. Work will also continue on determining the relative value of selective breeding, grading up and cross-breeding in different regions of the country. Further studies on nutritional requirements of Indian cattle and buffaloes will be undertaken. Investigations on the control and eradication of humpsore disease of cattle will be undertaken on a coordinated basis. Investigations on control of brucellosis in cattle and various diseases of sheep and goats, pigs and poultry will also be carried out. Breeding studies on pigs and other animals will also be extended. Studies on physiological norms of various species and breeds of livestock, on production of fodders and carrying capacity of pasture and forage crops will be undertaken. New schemes are also to be undertaken on investigations of mucosal disease and salmonella infection in farm animals and yellow disease of cattle. Investigation will also be undertaken on control of tuberculosis. It is proposed to start livestock research stations in the States for intensifying research on local and regional problem. Regional animal nutrition research stations will be placed on a permanent footing.

50. Selective breeding of sheep and cross-breeding with exotic breeds like Rambouillet has been carried out with a view to evolving suitable breeds for the production of fine apparel wool. In the Third Plan research will be undertaken on sheep production in mixed farming economy. Studies on artificial insemination will be extended in sheep. The Indian Council of Agricultural Research proposes to establish a Central Sheep and Wool Research Station.

51. In the field of poultry development, economic balanced poultry rations have been evolved. An indigenous strain of birds has been developed with high egg production. Methods were developed for defertilising eggs with a view to increasing their keeping quality. Cheap hatcheries were established successfully and the use of such hatcheries in forming poultry development blocks was demonstrated. Successful experiments were carried out in which briolers were produced having a body weight of 3½ pounds in 10 weeks. In the Third Plan, work on hybridisation of inbred lines of selected poultry breeds and progeny testing of poultry will be extended. Investigation on problems of housing poultry in cheap poultry houses constructed with material available in rural areas will continue. Coordinated schemes on economic poultry ration will be continued to investigate cheaper feeds including agricultural by-products and industrial wastes.

52. *Dairying.*—Research work has been undertaken on economical methods of manufacture of milk products and by-products under village conditions. Research on the bacteriological and chemical quality of milk in different regions has yielded information which has helped in

will also be sponsored on intestinal infestation with entamoeba, and various helminthic parasites. Research on mental diseases will be continued at the All-India Institute of Mental Health, Bangalore. Research on problems of maternity, child welfare, nutrition and related problems will also be expanded. Research facilities in medical colleges will be strengthened. Research in occupational health will be taken up at two or three new centres in addition to work at the All-India Institute of Hygiene and Public Health.

56. During the Second Plan, the Indian Council of Medical Research sanctioned the establishment of a number of research units to investigate indigenous drugs. So far seven such units have been established. During the Third Plan, additional drugs will be taken up for study.

57. Demographic, medical and biological research in family planning has been carried out during the Second Plan. A large number of mechanical and chemical contraceptives have been tested. Research on oral contraceptives, including meta-xylo-hydroquinone and indigenous medicines, is being undertaken. The Human Variation Unit at Bombay is carrying out work on the distribution of genes in certain areas. A long term study on twins and consanguinity begun in 1954 has also been carried out. These investigations will be continued and expanded during the Third Plan.

VII

Other Programmes of Research

58. *Irrigation and power.*—There are at present 19 hydraulic and irrigation research stations in the country. Two of them (Poona and Delhi) are maintained by the Central Government; the others are with the States. The Central Board of Irrigation and Power coordinates research in irrigation and power. In 1953, it formulated a comprehensive programme of fundamental and applied research on irrigation and assigned projects to different research stations. Among the problems taken up for investigation were air-entrainment, turbulence, cavitation, design of channels, properties of soils, sedimentation in relation to reservoir performance, underground waters, use of surkhi as a puzzolona and economic alternatives to stone in the construction of structures. These investigations will be continued during the Third Plan. New research problems to be taken up in the Third Plan include utilisation of isotopes in sub-soil water studies, compaction of different soils, development of pre-cast techniques for hydraulic structures, evolving silt disposal techniques, and measures for minimising losses due to absorption, percolation and evaporation.

59. It is proposed to expand the scope and functions of the present Power Research Institute at Bangalore and to establish a Switchgear Testing and Development Laboratory at Bhopal on a site adjacent to the

The Central Inland Fisheries Station, Barrackpore, will continue current investigations concerning pond culture, riverine, lacustrine and estuarine fisheries. The new projects to be initiated will include survey of the Brahmaputra, investigations on high altitude, fresh water and backwater fisheries, fish behaviour in relation to dams, etc.

The Central Deep Sea Fishing Station, Bombay, was established for charting marine fishing grounds, determining fishing seasons and fishing intensities, assessing the suitability of fishing implements, training of personnel, etc. During the Third Plan, besides expanding the exploratory and experimental fishing programmes at Bombay, Tuticorin, Cochin, and Visakhapatnam, additional units will be established at Mangalore, Kakinada, Paradwip and Port Blair.

The Central Fisheries Technological Research Station, Cochin, undertakes research on the design of fishing craft and gear, craft and gear materials and their preservation, methods of fishing and preservation of fish, commodity standards, and marketing and inspection. Larger programmes for investigating improved designs of mechanised fishing craft for different regions, beach boats, gear materials and their preservation, etc. will be undertaken during the Third Plan.

VI

Medical Research

55. Medical research is promoted and coordinated by the Indian Council of Medical Research. Programmes for the Third Plan have been drawn up against the background of work initiated during recent years. It is proposed to intensify research on communicable diseases like tuberculosis, cholera, leprosy, infantile diarrhoea, filariasis, etc. and to set up permanent research centres for tuberculosis and cholera.

A full-fledged centre for doing research on arthropod-borne viruses has already been established at Poona, and facilities for virus research at the Pasteur Institute, Coonoor, have been strengthened. The Indian Council of Medical Research has also encouraged research in virus diseases at selected medical colleges. Facilities have been provided at the Virus Research Centre, Poona, for training medical scientists in the techniques of virology. Work in the field of virus diseases will be expanded during the Third Five Year Plan, and a trachoma research centre will be established at Aligarh in association with the university.

The Indian Council of Medical Research has been supporting work in the field of cardio-vascular diseases, metabolic disorders, intestinal parasitism and venereal and other diseases. Besides continuing work in these fields, during the Third Plan, attention will be focussed on problems of metabolism concerning proteins and carbohydrates. Investigations

engineering. During the Third Plan period, the Institute also proposes to take up research on bridges.

62. During the Third Plan, the activities of the National Buildings Organisation will mainly centre round reduction in building costs through the introduction of new and cheaper materials, new building techniques and better methods of construction. The National Buildings Organisation will sponsor research and investigations on traditional and new building materials, more economic and efficient designs for buildings both in urban and in rural areas, bearing capacity of soils, suitability of soils for brick-making, suitable designs of foundations on shrinkable soils, strength of masonary, corrosion of steel and damp-proofing. Norms and standards are to be laid down for various types of buildings. Developments in techniques of construction such as prestressed concrete, shell construction, prefabricated construction, etc. will be promoted. Studies on productivity in different operations in the building industry will also be undertaken.

63. *Minerals*.—The principal organisations engaged in research and surveys for minerals are the Geological Survey of India, the Indian Bureau of Mines and the Oil and Natural Gas Commission.

The research activities of Geological Survey of India during the Third Plan period will comprise fundamental petrological, chemical and palaeontological investigations and applied studies relating to geological mapping, preliminary mineral assessment, investigation concerning coal, base metals and other minerals and metals, engineering geology, groundwater assessment and geophysical problems. Geophysical methods of exploration are being made use of by the Survey in the investigation of various types of mineral deposits, metallic as well as non-metallic.

Intensive geological studies for non-ferrous metals are to be undertaken by the Indian Bureau of Mines in different parts of the country. Studies on other minerals such as iron, coal, asbestos, bauxite, gold, diamond, etc. are also envisaged. Mining research will be intensified. Pilot plant investigations on the beneficiation of copper ore, copper-lead-zinc ores and manganese ore will be carried out. The utilisation of iron ore fines by sintering will have an important place in the Bureau's research programme. Suitable processes for the treatment of chromite, ilmenite sands, pyrites, gypsum, magnesite, limestone, diamonds, graphite, fluorspar and clays will be evolved. Analytical methods will be developed with new reagents for ores and minerals with a view to saving time and cost. Investigations into application of solvent extraction techniques in the chemical estimation of minerals and ores will also be carried out. Work on the utilisation of indigenous manganese dioxide for the manufacture of batteries, use of sillica in abrasives and the problems of ferro-manganese industry will be expanded.

Heavy Electrical Plant. The Power Research Institute at Bangalore will have four fully equipped Divisions dealing with high voltage, general electrical engineering, mechanical engineering, and hydraulic engineering as well as ancillary facilities for conducting pilot plant and miniature field studies. The Institute will provide scope for development work on electrical insulating materials available in the country such as wood, mica, paper, etc., development of potential and current transformers and other equipment and the study of lightning phenomena and vibration and mechanical problems of transmission lines.

60. *Transport and construction.*—The headquarters of the Railway Research, Design and Standards Organisation is at Simla, and its Research Directorate with testing and research equipment and a yard served both by broad gauge and metre gauge is at Lucknow. The Metallurgical and Chemical Section of the Research Directorate is situated at Chittaranjan and facilities for carrying out tests and trials for this Section have been established there. The main fields of research for the railways are interplay between track and wheels in motion, testing of prototypes involving trials of vehicles in motion and in rest, performance trials covering full assemblies like locomotives, rolling stock, track and bridges, components of these items, fuels, lubricants and preservatives, progressive replacement of imported items of railwav stores by indigenous products, utilisation of waste products such as coal ash, saw-dust and spent lubricants, and soil mechanics as applied to stability of banks, cuttings and foundations of structures.

61. The Ministry of Transport through its Roads Wing coordinates, assists and sponsors research relating to roads. Some of the problems in the field of roads to which attention has been devoted during the past few years, specially at the Central Road Research Institute, include methods of soil stabilisation using locally available materials for evolving cheap all-weather roads, stabilisation of black cotton soils for road construction, study of bearing value of soils, evaluation of stone and brick aggregate for road construction, bituminous stabilisation of fine sands, use of local *kankar for roads in desert areas,* specifications for bituminous roads in areas of very heavy rainfall, methods for quick repair of culverts and minor bridges, design and thickness of various types of pavements, load transmission properties of various materials used in road construction, road construction methods in marshy areas, investigations on road users' behaviour, geometric design of roads and crossings suitable for mixed, slow and fast traffic, traffic problems for achieving safety on the roads, and improvements in the designs of bullock-cart wheel axle system. During the Third Plan, the Roads Wing proposes to undertake experimental construction of low cost stabilised soil roads for light traffic. The research programme of Central Road Research Institute is divided under five broad categories, namely, soils, bitumen, concrete, road design and traffic

techniques and equipment will be undertaken. Standardisation and development of audio equipments required for broadcasting and stereo techniques for stereo transmission and reception will be undertaken. Another important project will be the development of suitable indigenous sound absorption and insulation material for use in studios.

66. The programme of work of the Wireless Planning and Coordination Branch of the Ministry of Transport and Communications includes amongst others—

(i) systematic study of atmospheric noise in the band of 50 kilocycles to 30 megacycles;

(ii) systematic study of ionospheric conditions existing at different localities in India;

(iii) systematic measurements for the evaluation of the degree of interference produced by man-made noises in urban areas; and

(iv) determination of signal to noise ratios required for different percentages of reliability of working of various types of telecommunication circuits.

The main activity of the Telecommunications Research Centre, which functions under the Directorate General of Posts and Telegraphs, is to undertake investigations and development work in order to improve the telephone and telegraph services to the public and to provide designs of telecommunication equipment to the Indian Telephone Industries and other manufacturing units in the country.

67. Principal projects to be carried out by the Research and Development Directorate of the Civil Aviation Department during the Third Plan period are: (i) full-scacle structural tests on airframes and wings, (ii) type testing of piston and turbine power plants including propellors, (iii) development and standardisation of indigenous aircraft materials, equipment and processes, (iv) development of safety devices, (v) design and development of gliders and light aircraft for personal agricultural and other uses, and (vi) study of fatigue of aircraft structures and other problems of primary importance to civil aviation

VIII

SUGAR, JUTE AND OTHER INDUSTRIES

68. Research for the metallurgical, engineering, chemical, food and mining industries is being undertaken in the national laboratories and in various departments and research institutions. Besides these, reference should be made to the research programmes relating to sugar, jute, cotton, and silk and art silk industries, and to cottage and small scale industries

The research work of the Oil and Natural Gas Commission is undertaken through the technical Divisions for geology, geophysics, and engineering. The Geology Division is concerned with photo-geomorphological studies in respect of some 250,000 square miles of territory for delineating subsurface structural trends. The Division also proposes to undertake studies on drilling muds, oil well cements, properties of core samples, testing and treatment of crude oils, petroleum source rock studies and flow properties of natural gas through porous media.

64. *Communications.*—Research on communications includes meteorology, broadcasting, wireless and telecommunications and civil aviation.

In the Third Plan, the workshop and laboratories of the Meteorological Department are proposed to be expanded and improved with a view to attaining self-sufficiency in respect of instruments required for use in meteorological observations. Electronic instruments for measurement of cloud height and thickness, wind determination, and storm-detecting radar will be designed and developed. It is also proposed to bring out a treatise on the Meteorology of India and an Agro-Climatological Atlas of India. The network of Rawinsonde-Radiosonde Stations will be strengthened by starting 18 additional stations with modern equipment. Additional seismological observatories will be established and seismographs will be made in the workshops of the Department. Work on atmospheric electricity and atmospheric pollution measurement will be started at a few stations. The Colaba Observatory will take up ionospheric studies and study of night sky and air glow. Facilities for astrophysical and astronomical studies will be expanded at the Kodaikanal Observatory, and at a Central Astronomical Observatory to be started near Ujjain and at a Naval Astronomical Observatory. It is also proposed to set up a Northern Hemispheric Collection and Analysis Centre at New Delhi to collect, study and disseminate meteorological data and analyses for the whole northern hemisphere. This project is important for aviation weather forecasting and specially for forecasting for long distance aviation.

65. The programme of work to be carried out during the Third Plan period by the Research Department of the All India Radio will include intensification of studies in the fields of very high and ultra high frequencies and microwave techniques and propagation, semi-conductor and transistor technology and their application to designs of equipment for broadcasting, and television transmission and reception. It is proposed to augment and improve equipment and facilities for collecting ionospheric data for investigation on atmospheric noise and ionospheric absorption and for studies on scatter propagation. To facilitate exchange of recorded material between the All India Radio and other broadcasting organisations, standardisation of tape-recording

69. *Cottage and small scale industries.*—A Central Research Institute for Village Industries under the All-India Khadi and Village Industries Board is functioning at Wardha. The Institue has laboratories for control and development of processes and products, workshops for designing and developing improved tools and implements, and experimental production centres for the study of tools and techniques. Besides this Institute, a number of other research centres have also been established.

The Coir Board maintains the Central Coir Research Institute in Kerala and a branch institute in West Bengal. The Board proposes to undertake research on both fundamental and applied aspects of coir fibre and yarn. Fundamental schemes will be directed towards the elucidation of the physical, chemical, biological and other basic properties of coir fibre and yarn. Comparative study of competing fibres such as sisal and aloe will also be undertaken. Applied research schemes will centre round methods of extracting coir fibre so as to reduce retting time and labour, an improved pedal-operated spinning machine, rope-making machines, three matting looms pilot plant, utilisation of coconut pith and coir waste, dyeing of coir fibre and yarn and development of new and non-conventional uses for coir and coir products.

There are three research institutes for sericulture one each in West Bengal, Mysore and Assam. The Central Silk Board proposes to set up two regional research stations in Bihar and Jammu and Kashmir and a sub-station at Kalimpong. The main problems of the silk industry concern improvement in quality and reduction in costs. At the research stations efforts will be made to evolve new and improved silkworm races.

The Handloom Board has drawn up plans to re-organise the two existing institutes for handloom technology. The Board has in view a number of research schemes, such as design of suitable small sizing and beaming equipment, use of non-mulberry silk fabrics, cottage-scale dyeing and processing of synthetic fibres, anti-crease and other finishes for handloom fabrics, design of a portable reeling machine for tussore, use of vegetable colours in combination with synthetic ones, and mechanical preparation of bamboo reeds.

In the field of small scale industries, it is proposed to consolidate and enlarge the activities of the Small Industries Service Institutes and the Extension Centres including those pertaining to research on problems like proper use of raw materials, improved technical processes and design of machinery.

IX

RESEARCH IN UNIVERSITIES AND INSTITUTES OF HIGHER TECHNOLOGY

70. Fundamental research in all branches of science has to be undertaken mainly in the universities. They are also the source of all the

Research on sugar is undertaken at the National Sugar Institute, Kanpur. The Institute has a programme for the Third Plan period which includes the provision of laboratory equipment for advanced research, an experimental factory and fabrication of pilot plants. Among problems to be studied are combustion control, research on high polymers and on candy and confectionary industries, and utilisation of by-products.

The Technological Research Laboratories of the Indian Central Jute Committee has a programme of research on composition and chemical modification of jute hemicelluloses so as to render them more resistant to swelling in water and attack by micro-organisms, effects of heat and moisture on fibres, orientation and cell dimension of jute fibres at different stages of growth, study of bacteria and fungi which ret jute plants, utilisation of jute sticks for pulp and paper, possible new uses of jute including furnishing fabrics, improvement of wet strength of bleached jute yarn, prevention of seepage of cement from jute bags, manufacture of non-woven fabrics for book-binding cloth, rexin and other purposes, and improvements in the processing of mesta and other substitute fibres. The Research Institute of the Indian Jute Mills Association is engaged in the study of mechanical and other properties and chemical composition of jute and bast fibres, effects of fungi, bacteria and environmental factors on deterioration of jute and the development of proofing and finishing operations for jute fabrics.

The Technological Laboratory of the Indian Central Cotton Committee undertakes spinning tests, measurement of fibre properties and determination of spinning value with a view to help the breeders. The Ahmedabad Textile Industries Research Association (ATIRA) has a programme of studies for the Third Plan which includes relationship between molecular structure and properties of cellulose, nature of polymer formation when thermosetting resins are applied to cotton fibres, effects of addition of softeners and inorganic salts on properties of polymers like starch, used in making size mixtures, improvement of thermal drying processes, effect of drying processes on finish, technology of washing, design and development of scientific instruments required by the textile industry, effect of arrangements of fibres in yarn on yarn quality, and mechanism of absorption of different substances by textile fibres.

The Silk and Art Silk Mills Research Association came into being in 1958-59. Its pilot mill, laboratories and technical institute are nearing completion. The Association proposes to investigate problems presented by its members in respect of fibres, yarns and fabrics, to locate defects in manufacturing processes and suggest methods for removing them and to assess the suitability of rayon fabrics for export. Improvement of fibre production, yarn processing, fabric manufacture and finishing will also be undertaken.

and structural dynamics were taken up. The Indian Institute of Science, Bangalore, was engaged in research in power engineering, metallurgy, internal combustion engines, gas turbines and aeronautical engineering. The Indian Institute of Technology, Kharagpur, was carrying out research in electron tube oscillators and amplifiers, transistors and microwaves, naval architecture and ship model tank experiments.

73. Facilities at the various national laboratories are also being increasingly used for carrying out schemes of engineering research such as wind power, water purification, solar power, etc. as well as for various mechanical, electrical and telecommunication projects. Among the national laboratories engaged in engineering research are the Central Road Research Institute, the Central Building Research Institute, the National Metallurgical Laboratory, the Central Fuel Research Institute, the Central Electronics Engineering Research Institute, the Central Public Health Engineering Research Institute, the Central Mechanical Engineering Research Institute and the Central Mining Research Station.

Considerable engineering research work is also being carried out at the Atomic Energy Establishment, Trombay. It is directed mainly towards solving engineering problems connected with the design and construction of atomic reactors for research and for the production of economic nuclear power. Work is also proceeding on the testing of materials and complete reactor systems under actual irradiation conditions. Research work in connection with the production of electronic instruments and of silicon and germanium for the manufacture of transistors is also in hand.

Larger resources are being provided in the Third Plan for the promotion of engineering research. A special committee is at present engaged in studying programmes relating to post-graduate education and research in engineering.

74. *Research in statistics.*—Facilities for statistical investigations and research have been considerably expanded during the first two Plans. The National Sample Survey is the principal agency for undertaking sample surveys for the collection of statistical data. The State Statistical Bureaus collaborate with the National Sample Survey over a wide range of sampling enquiries. Fundamental research in the theory of statistics and development of new statistical tools for applications in different fields is undertaken by the Indian Statistical Institute which is also responsible for the design of enquiries undertaken by the National Sample Survey and for tabulation of data collected by it. Technical studies relating to planning are carried out by the Economic Wing, the Operational Research Unit and the Regional Survey Unit of the Indian Statistical Institute. The Central Statistical Organization and the State Statistical Bureaus work in close collaboration with one another. The Central Gov-

technical and scientific manpower required for the development of industry. In the context of the rapid advance of science and technology, the role of the universities has become extraordinarily important. Support for basic research in the universities is essential for ensuring the quality of applied research in every field. Organisations like Council of Scientific and Industrial Research, Indian Council of Agricultural Research and Indian Council of Medical Research sponsor research projects at the universities, but, in the nature of things, their emphasis has to be largely on applied research. The University Grants Commission has endeavoured to assist the expansion of facilities for basic research in the universities.

71. There are at present 46 universities besides the institutes of technology. A majority of them have facilities for advanced research in several branches of science. During the Second Plan, a number of centres of specialised research were established in the universities with assistance from the University Grants Commission, as for example, experimental astronomy at Hyderabad, theoretical astronomy at Delhi, cosmic ray research at Aligarh, and Jammu and Kashmir, biological oceanography at Annamalai, and Trivandrum, X-ray and crystallography in Calcutta, Andhra, Delhi and Aligarh, spectroscopy at Banaras and Karnatak, electronics and applied physics at Calcutta and Allahabad, animal genetics at Chandigarh and plant physiology at Banaras, Delhi and Calcutta. The Council of Scientific and Industrial Research has sponsored a School of Earthquake Engineering Research at the University of Roorkee. In the Third Plan period, the existing research departments will be consolidated and strengthened and research facilities will be developed in such fields as applied geology, geophysics, radio-astronomy, oceanography and basic medical sciences.

72. *Engineering research.*—Although the University of Roorkee had done pioneering work in hydraulics research during the nineties of the last century, engineering research in the country had made little more than a beginning by the close of the First Five Year Plan. With the advent of large scale development in industry under the Five Year Plans, new opportunities came to India's engineers to undertake original and creative research and to assume responsibility for all major designs, fabrication and construction. However, even at present, only a few of the engineering colleges have facilities for research, although these are now being developed in the higher technological and post-graduate institutions, such as the Indian Institute of Science, Roorkee University, Jadavpur University, Madras Institute of Technology and the Institutes of Technology at Kharagpur, Bombay, Madras and Kanpur. During the Second Five Year Plan, hydraulics research was revived at the Roorkee University and additional research problems in earthquake engineering

76. The same lags in the utilisation of the results of research which appear in industry are also found in other fields of development such as transport, construction and power. Promising results are secured and new designs, techniques and specifications are evolved. For lack of extended application, due possibly to conservatism or inertia, full value is not realised from expenditures incurred on research, thereby slowing down the process of technical advance and modernisation. In the field of road development, research laboratories of the Central and State Governments have been engaged in evolving improved methods of construction and specifications to ensure their rapid application. It has been suggested that States should devote one per cent of their plan allocations for roads to experimental techniques and construction of suitable stretches of roads provided for in the Third Plan. To cover the possible risk and to meet the additional expenditure that may be involved, a special provision has been made in the roads programme at the Centre. It is proposed that a committee of the Indian Roads Congress should select new techniques of road construction for extended trials. This approach is capable of extended application in other fields of construction and in public utilities.

77. *Inventions and patents.*—The technological progress of a country is marked by large numbers of inventions, some of major significance and based on prolonged research in the laboratories, others in the nature of improvisations and solutions discovered in the course of every day work by skilled workers and technicians. For the process of industrialisation to strike roots of its own, it is essential that in all fields an effort should be made to stimulate the creative faculties of scientists, technicians and others. In 1959, the Central Government set up the Inventions Promotion Board with the object of encouraging and inculcating the spirit of invention amongst independent workers, artisans and technicians and providing technical and financial assistance. It is to be hoped that State undertakings as well as enterprises in the private sector and various agencies of the Central and State Governments will formulate their own schemes for encouraging inventions on the part of their workers and technicians and give them the necessary support in working out and developing their ideas.

Patents are intended to provide a legal framework favourable to inventions and to their speedy adoption in industry. However, for a considerable period dissatisfaction has been expressed regarding the working of the law relating to patents. A very large proportion of Indian patents are held by foreigners, and of these only a few are being actually worked in the country. A comprehensive review of the legislation and of the administrative and other arrangements relating to patents has recently been undertaken, and proposals on the subject are under the consideration of the Central Government.

ernment has recently established the Department of Statistics for advising Ministries and States on statistical matters and providing general directions regarding the setting up of standards and norms and methods of collection of statistics. In the field of agricultural statistics, research is undertaken by the Institute of Agricultural Statistics.

X

UTILISATION OF SCIENTIFIC RESEARCH

75. The importance of ensuring speedy and extensive utilisation on a commercial scale of the results of scientific research has been stressed for several years. The National Research Development Corporation was set up with the object of exploiting the results of laboratory research for commercial production. Since its inception seven years ago, the Corporation has negotiated about 120 licenses for items based on research undertaken within the country, of which more than 30 are in commercial production. The Corporation has also instituted 16 developmental projects. However, a large proportion of the inventions made in the country still remain to be exploited. Intervals between the time when the results of laboratory research become available and their wider application, are at present considerable and there is need for more effective action. It has been suggested that the rapid utilisation of the results of research is hindered on account of such factors as lack of pilot plant facilities and of design and fabrication facilities, inadequate liaison between industry and research organisations, insufficient attention on the part of industry to the urgent need to secure indigenous production to replace imported articles, and inadequate coordination between licencing policies and programmes for the development of research. Facilities for design and fabrication of pilot plants are now available in much larger measure than before and such deficiencies as exist will be made up to a considerable extent during the Third Plan. The other aspects to which attention has been drawn above are essentially matters of an organisational approach. It is crucial that there should be close association between research workers and individual industries, fuller knowledge and greater understanding on their part, both of problems requiring solution and of the results obtained, and adoption by such industries of carefully considered schemes for the utilisation of the results of research, replacement of imported items by indigenous manufactures and achievement of higher standards based on research undertaken within the country. In particular, Development Councils and other organisations concerned with different industries should regard such schemes as an essential of their programmes of development during the Third Five Year Plan. They should ensure that research workers receive the necessary assistance and facilities from industrial plants and from executives and engineers in different industries.

metric system has been adopted in several sectors. Industries using the system in their commercial transactions, include cotton and jute textiles, iron and steel, non-ferrous metals, engineering, chemicals, cement, paper, petroleum, etc. Rates of customs and excise duties are now expressed in metric units and the railways, ports, shipping, import and export trade control and a number of other agencies of the Central and State Governments have changed over to the metric system. In certain areas, metric weights were first introduced in October, 1958, and have been compulsory since October, 1960. In the rest of the country, metric weights will be compulsory from April, 1962. It is proposed to introduce metric capacity measures in trade in 1961 and metric length measures in 1962. In the course of the next three years, the metric system will have replaced other systems to a substantial extent. After December, 1966, the metric system will be the only system recognised by law.

80. *Standardisation.*—Standardisation has an important role in industrial development and in the efficient utilisation of resources. Since its establishment in 1947, the Indian Standards Institution has evolved national standards in most fields of industry, including agriculture and food products, and there are at present about 1900 standards in force. Under the Indian Standards Certification Mark Act, 1952, increasing numbers of licences are being issued for certifying goods conforming to Indian Standards. The Indian Standards Institution works in close cooperation with industry. The objectives of standardisation are promoted through special Standards Conventions and, as a matter of policy, the Central and State Governments adopt the procedure of indenting supplies on the basis of Indian Standards. During the Second Plan, the rate of preparation of Indian Standards increased by about 70 per cent. In the Third Plan, the rate achieved at the end of the Second Plan is expected to be doubled. Greater emphasis will be laid in the Third Plan on standards of consumer products. With a view to strengthening the implementation, efforts will be made to encourage standardisation at the plant level, to establish and strengthen consumer organisations and, generally, to intensify programmes of public education. To facilitate the introduction of the metric system in different branches of industry and commerce, the Indian Standards Institution is engaged in converting existing standards and evolving others required for controlling the new weights and measures. The Institution's present facilities, including research laboratories and scientific and technical personnel, will be considerably augmented. Besides arranging for the investigation of problems in various laboratories throughout the country, the Institution will study a series of long-range problems in its own research laboratories.

81. *Quality control.*—While standards define the levels of desirable quality to be maintained in products, their actual achievement depends upon various techniques which fall under the broad description of

XI

SCIENTIFIC INSTRUMENTS

78. Dependence on other countries for the supply of scientific instruments has been an important obstacle in the development of scientific research and in the extension and improvement of facilities for the teaching of science in schools and colleges. The Scientific Instruments Committee (1959) assessed the demand for scientific instruments in different fields and recommended the establishment of a Scientific Instruments Directorate in the Ministry of Commerce and Industry and of a Central Scientific Instruments Organisation under the Council of Scientific and Industrial Research. In pursuance of these recommendations, the Council of Scientific and Industrial Research constituted a Central Scientific Instruments Organisation in October, 1959. The Organisation has undertaken surveys relating to technical problems in the manufacture of scientific instruments, availability of raw materials, expansion of productive capacity, quality control, etc. In recent years, there has been some progress in the production of scientific instruments. There are at present 35 large and medium units engaged in manufacturing scientific, drawing, surveying, mathematical and industrial instruments. Their total production has increased in value from Rs. 63 lakhs in 1956 to Rs. 3 crores in 1960. The capacity of the National Instruments Factory, Calcutta has been increased. There is considerable scope for the production of scientific instruments by small units whose total production has also risen in value between 1956 and 1960 from Rs. 35 lakhs to Rs. 90 lakhs. Considering that imports of scientific instrument have been in the range of Rs. 10 crores a year, this is a field in which large increases in production can be speedily achieved. To enable existing and potential manufacturers to arrange for production on a long-term basis, it is essential that Government departments and educational institutions should plan their requirements on a long-term basis and make these known to manufacturers, firm orders being placed to the extent possible. It is observed that under the existing procedures, even apart from the absence of advance planning, sometimes funds are allotted to educational institutions late in the year, resulting perhaps in hasty expenditures and unsatisfactory purchases. The purchase organisations of the Central and State Governments and the various indenting authorities should collaborate in the improvement of the prevailing procedures in relation to the development of the scientific instruments industry.

XII

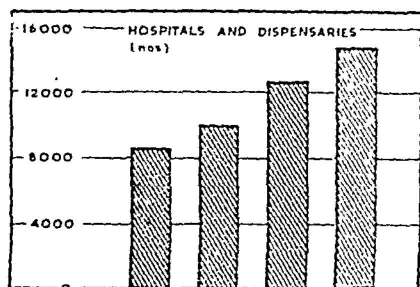
STANDARDISATION, QUALITY CONTROL AND PRODUCTIVITY

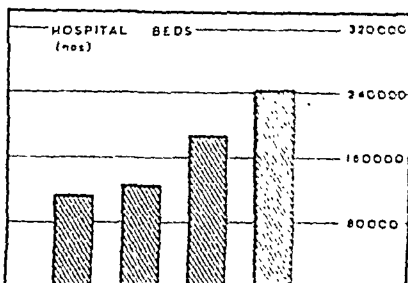
79. *Metric weights and measures.*—The decision to standardise weights and measures throughout the country on the basis of the metric system was taken early in the Second Plan. During the past two years, the

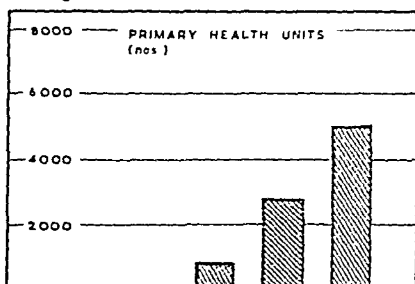
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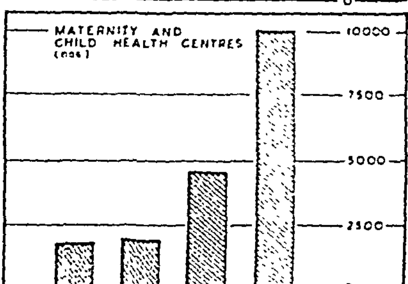
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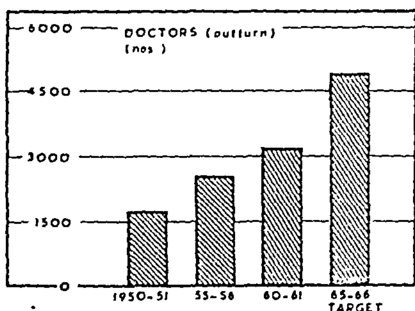
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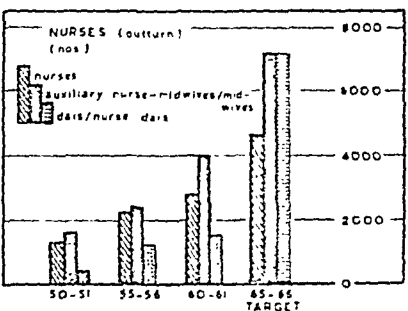


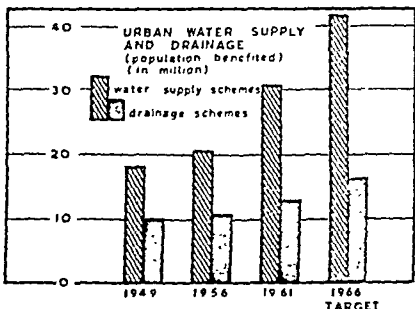


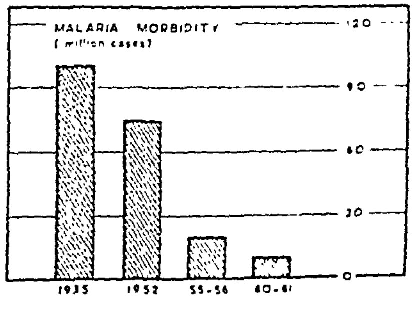












'quality control'. Statistical methods of quality control and sampling techniques are among the most important tools for this purpose and, if correctly applied, lead to substantial increase in efficiency in the utilisation of materials, machinery and personnel and in ensuring the desired quality. The Indian Statistical Institute and its branches undertake the training of personnel and advise industries on problems of statistical quality control. Activity in this field has grown in recent years and is expected to expand more rapidly during the Third Plan. Quality control has unlimited possibilities and its effects in improving the quality of products, creating consumer confidence and expanding exports are of great significance for the development of the economy. Quality marking schemes which are being increasingly introduced,—the Indian Standards Institution's certification marking, Agmarking schemes and schemes operated by Export Promotion Councils—represent activities which need to be extended during the Third Plan to many new fields. In particular, pre-shipment inspection and other methods of ensuring the quality of export products should be adopted systematically in all fields, and, if need be, efforts in this direction should be supported by legislation.

82. *Productivity*.—The rate at which average levels of productivity rise in different sectors is a true measure of the pace and quality of the advance achieved. As has been stated in an earlier Chapter, the only enduring basis for the strength and dynamism of the economy is a rising level of productivity. The productivity movement in the country is yet in its beginnings. However, there is growing realisation of its importance and since the inception of the National Productivity Council in 1958, industry is being increasingly involved in the drive to raise productivity. Over the past three years under the auspices of the National Productivity Council, 43 local productivity councils have come into existence and large numbers of persons have participated in seminars and discussions on productivity and in the effort to make the techniques and problems in this field more widely understood. The National Productivity Council has organised 230 training courses in which about 4000 managers, technicians and supervisors have taken part. Senior executives have also participated in advanced management programmes. In due course, the programmes of the National Productivity Council are expected to be linked up with the work of the proposed All-India Institutes of Management and the National Institute for Training in Industrial Engineering. In the Third Plan, it is proposed to extend the general training programmes for managers, technicians and supervisors to apply productivity techniques in plants on a larger scale and to train instructors in selected productivity techniques. A nation-wide effort to lift levels of productivity involves not only more efficient methods and organisation and a scientific approach, but also changes in human and personal relationships, recognition of the worth of each man, team work and, within each undertaking, a continuing sense of common interest and obligations.

CHAPTER XXXII

HEALTH AND FAMILY PLANNING

THE broad objective of the health and family planning programmes in the Third Plan is to expand health services, to bring about progressive improvement in the health of the people by ensuring a certain minimum of physical well-being and to create conditions favourable to greater efficiency and productivity. Increased emphasis will be laid on preventive public health services. As in the Second Plan, specific programmes have been formulated for the Third Plan for improvement of environmental sanitation, specially rural and urban water supply, control of communicable diseases, organisation of institutional facilities for providing health services and for the training of medical and health personnel, and provision of services such as maternal and child welfare, health education and nutrition. The Third Plan also accords very high priority to family planning.

2. As against outlays of Rs. 140 and Rs. 225 crores in the First and Second Plans respectively, programmes in the Third Plan involve a total outlay of about Rs. 342 crores, about Rs. 297 crores being in the States and the rest at the Centre. These amounts are distributed under different heads as follows:

Table 1: Distribution of outlay

(Rs. crores)

programme	First Plan	Second Plan	Third Plan
health			
water supply and sanitation (rural and urban)	49·0	76·0	105·3
primary health units, hospitals and dispensaries	25·0	36·0	61·7
control of communicable diseases	23·1	64·0	70·5
education, training and research	21·6	36·0	56·3
indigenous systems of medicine, homoeopathy and nature cure	0·4	4·0	9·8
other schemes	20·2	6·0	11·2
family planning	0·7	3·0	27·0
total	140·0	225·0@	341·8

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HEALTH

PROGRESS AND PROGRAMMES

3. During the past ten years, substantial progress has been made in various health programmes, and in several directions there have been notable advances. Measures adopted for the control of malaria have

@The actual expenditure is expected to be of the order of Rs. 216 crores.

6. The broad aim in the Third Plan will be to remove the shortages and deficiencies mentioned above. A major objective is that, to as large an extent as possible, supplies of good drinking water should be available in most villages in the country by the end of the Third Plan. Institutional facilities will be expanded so that medical and health services reach progressively larger numbers of persons, specially in the rural areas. The programme for the eradication of malaria will be completed and efforts will be made to eradicate small pox and to control filaria, cholera, tuberculosis, leprosy and other communicable diseases. Drainage programmes will be undertaken on a larger scale in the urban areas.

The specific physical targets proposed for the Third Plan along with statistics of progress in the First and the Second Plans are given in summary form in the Table below:

Table 3: Achievements and targets

categories/unit	1950-51	1955-56	1960-61	1965-66
hospitals and dispensaries				
institutions	8600	10000	12600	14600
beds	113000	125000	185600	240100
primary health units	..	725	2800	5000
medical education				
medical colleges	30	42	57	75
annual admissions	2500	3500	5800	8000
dental education				
dental colleges	4	7	10	14
annual admissions	150	231	281	400
training programmes				
doctors@	56000	65000	70000	81000
nurses@	15000	18500	27000	45000
auxiliary nurse-midwives and midwives	8000	12780	19900	48500
health visitors@	521	800	1500	3500
nurse-dais/dais@	1800	6400	11500	40000
sanitary inspectors@	3500	4000	6000	19200
pharmacists	N.A.	N.A.	42000	48000
control of communicable diseases				
malaria				
units	..	133	390	390*
population covered (millions)	..	107	438	497
filaria				
units	..	11	48	48
population covered (millions)	..	15·1	24·6	N.A.
tuberculosis				
B.C.G. teams	15	119	167	167
T.B. clinics	110	160	220	420
T.B. demonstration and training centres	..	3	10	15
beds	10371	22000	26500	30000
leprosy				
subsidiary centres	..	33	135	235
venereal diseases				
V.D. clinics	..	..	83	189
maternity and child health centres	1651	1856	4500	10000

@Number indicates the number in practice or in service.
N.A.—Not available.
*The units will be withdrawn gradually in the latter part of the Third Plan.

resulted in marked decline in the incidence of the disease. In 1958, in place of control, the programme of complete eradication of malaria was adopted. In controlling other communicable diseases like filaria, tuberculosis, leprosy and venereal diseases also appreciable progress has been made. The number of hospitals and dispensaries has increased from 8600 in 1950-51 to 12,600 in 1960-61 and of beds from 113,000 to 185,600. A basic type of health organisation providing an integrated preventive and curative service has been established in 2800 development blocks with a population of about 200 million. At the end of the Second Plan, there were 78 institutions teaching indigenous systems of medicine, their annual intake being 1375. Facilities according to the indigenous systems are at present available in 98 hospitals and 5372 dispensaries with a total bed strength of 2462. About 664 schemes of urban water supply and drainage entailing a total cost of Rs. 112 crores have been completed or are in progress. In addition to schemes of rural water supply implemented under the programmes for community development, local development works and welfare of backward classes, about 228 schemes with an estimated cost of Rs. 20 crores have been taken up under the Health programme.

4. Statistics concerning birth and death rates are subject to serious limitations, and for the period subsequent to 1951 only rough estimates can be made. Nevertheless, the following Table indicates in broad terms steady improvement in the health of the population:

Table 2: Birth rates, death rates and expectation of life—1941-61

period	birth rate	death rate	infant mortality rate		expectation of life at birth	
			male	female	male	female
1941-51 . .	39·9	27·4	190·0	175·0	32·45	31·66
1951-56 . .	41·7	25·9	161·4	146·7	37·76	37·49
1956-61 . .	40·7	21·6	142·3	127·9	41·68	42·06

5. Although there has been considerable development in the field of health and in the related services, at the end of the Second Plan, certain deficiencies were specially marked. Thus, in relation to needs the institutional facilities were quite inadequate, specially in the rural areas. Doctors were not evenly distributed between urban and rural areas and, as against concentration in many urban areas, in the rural areas generally there were shortages, and the existing institutions did not have their full complement of personnel. Progress in the control of communicable diseases was hampered in several parts of the country on account of shortages of trained personnel and to some extent also of supplies of the equipment. Despite a measure of progress in rural water supply, there were large rural tracts which lacked safe drinking water. In many urban areas problems of drainage have been accentuated on account of the rapid growth of population.

of piped water supply and works of an engineering character are to be catered for by provisions under the Health programme, but for such schemes there could be a part contribution from funds available under the Village Water Supply Programme on the scale of Rs. 10,000 per village. The Village Water Supply Programme is to be undertaken at the block level through Panchayat Samitis and Village Panchayats, the funds being routed through the organisation at the block level. It is proposed that there should be a broadly agreed programme at the local level under which all the provisions available for water supply are effectively utilised. The programme should be based on careful surveys.

10. Along with rural water supply much greater attention should now be given to the programme of rural sanitation specially to the sanitary disposal of excreta in the villages. Problems relating to the proper design and construction of village latrines and the educational and organisational aspects of the programme for their promotion have been recently studied. The broad lines of an action programme in this field may be said to be fairly established. Although, in the beginning progress may be slow, it is important that in each development block an effort should be made to create greater awareness of rural sanitation problems and to introduce the use of sanitary latrines in schools and camps for groups of houses and, where possible, in individual houses. It would facilitate the introduction of latrines if the local sanitary inspectors are trained in casting the latrine sets. With the participation of the local people these latrines can be constructed at a fairly low cost. If this work is undertaken as a block programme it should be possible to achieve substantial results within a foreseeable period. Health education is of course a most important aspect of the programme of rural sanitation. The advantages and convenience of clean, odourless and cheap latrines are obvious. They are no less essential for conserving the fertilizer value of human wastes and enriching the soil.

11. *Urban water supply.*—Urban water supply schemes are being executed by municipalities and corporations with loans provided by the Central and State Governments. The following priorities for the selection of areas for urban water supply programmes which were accepted for the Second Plan will also be observed in the Third Plan:

(1) municipal areas without any protected water supply arrangements;

(2) improvement or expansion of existing facilities for water supply in urban areas where the present arrangements are either inadequate or unsafe from the public health point of view;

(3) pilgrim centres; and

WATER SUPPLY AND ENVIRONMENTAL SANITATION

7. *Rural water supply.*—Problems of rural water supply vary from region to region and often within the same region. Rural water supply schemes have been taken up, in the main, under the programmes for community development, local development works and welfare of backward classes. These are supplemented by the national water supply and sanitation programme under Health which deals with the provision of water supply to groups of villages through works requiring a measure of technical skill in design and construction. The programme gives priority to areas of great water scarcity and salinity and those in which water-borne diseases are endemic. The expenditure incurred on this scheme during the First and Second Plans is estimated at about Rs. 33 crores and 11,000 villages were provided with water supply through pipes.

8. Surveys to ascertain the present state of rural water supply are being undertaken in a number of States. Where such surveys have not been initiated, it is necessary to arrange for them, so that for every State a correct assessment of the extent of the problem may become available as a basis for detailed programmes to be implemented during the Third Plan. To achieve the objective of making supplies of good drinking water available to most villages in the country by the end of the Third Plan, it will be necessary not only to make an intensive effort, but also to ensure that at every stage there is effective coordination between all agencies concerned in carrying out the programme of rural water supply at the district and block levels and to mobilise local initiative and contribution to the utmost. Experience during the First and Second Plans has shown that great care is needed in preparing technical designs and estimates of rural water supply schemes and in keeping down their cost.

9. Under different programmes a provision of about Rs. 67 crores is available in the Third Plan for rural water supply. This includes Rs. 35 crores for the Village Water Supply Programme, about Rs. 16 crores under the plans of the States under Health, about Rs. 12 to 13 crores under the community development programme and about Rs. 3 to 4 crores under the programme for the welfare of backward classes. The greater part of the amounts provided for the Village Water Supply Programme are intended to be available for (a) backward areas, (b) areas not covered by community development programme, (c) pre-extension blocks, and (d) blocks which have completed their first and second stage in the community development programme. The Village Water Supply Programme is intended primarily to deal with the rural water supply at the village level. As a rule, the ceiling of Rs. 10,000 per village is to be observed. The public contribution is generally expected to be about 50 percent, but this proportion may be changed and modified in difficult areas or in backward areas. Schemes for groups of villages which involve provision

schemes to be taken up by the States, the following important schemes will be completed or taken up: water supply and drainage schemes of Madras, Jabalpur, Bangalore, Mangalore, Delhi, Calcutta, Bombay and Kaval Towns of Uttar Pradesh, Visakhapatnam and Manjeera Water Supply schemes of Andhra Pradesh, Ernakulam-Mattancherry and Trivandrum water supply and drainage schemes of Kerala.

15. The urgency and importance of providing drainage and sewerage and arranging for safe disposal of sewage in towns and cities need greater attention. These facilities are at present lagging behind the water supply facilities, and it is necessary that schemes of drainage and sewerage are considered simultaneously with those for water supply and are carried out under a coordinated programme. This would insure against the risk of increased breeding of mosquitoes and deterioration in the sanitary conditions of the towns as a result of water supply schemes. It would be desirable to set apart for sewerage schemes, say, 20 to 30 per cent of the estimated cost of water supply projects in cities with a population over 100,000.

PRIMARY HEALTH UNITS, HOSPITALS AND DISPENSARIES

16. By the end of the Second Plan, 2800 primary health units will have been established, covering most of the development blocks. The number of hospitals and dispensaries will increase from 8600 in 1951 to 12,600 in 1961 and during the same period the number of beds will increase from 113,000 to 185,600. The working of primary health units during the Second Plan shows that among factors affecting the progress of this programme were (i) shortage of health personnel, (ii) delays in the construction of buildings and residential quarters for staff and (iii) inadequate training facilities for different categories of staff required for service in rural areas. The need has also been felt for strengthening the primary health units and to possibility of integrating as early as may be feasible services such as those for the control of malaria, tuberculosis etc., with the normal activities of health units. Among other steps to be taken to improve the efficiency of primary health units, are the provision of the minimum staff required, organisation of the necessary training facilities and the integration of the activity of primary health units with other health services available in the area.

17. Difficulties have been experienced in securing a sufficient number of doctors. In order to create the necessary climate and conditions for securing personnel for rural areas, the following measures are suggested:

(i) As is the practice in some States, there should be a single cadre for personnel working in rural as well as urban areas. Service rules may stipulate that each incumbent in the cadre has to put in a certain period of service in rural

(4) *areas having piped water supply and therefore requiring* new sewerage or improvement to existing sewerage to remove waste and eliminate hazards to public health.

12. Urban water supply and sanitation schemes taken up in the first two Plans were designed to provide safe water supply and drainage facilities to a total urban population of 15 million. Of these, 450 schemes will be completed by the end of the Second Plan and the rest will continue into the Third Plan. Among the important schemes taken up during the First and the Second Plans are: Vaitarna-cum-Tansa scheme of Bombay, schemes for the improvement of water supply and drainage in the cities of Delhi, Calcutta, Madras, Bangalore, Ahmedabad, Kaval towns of Uttar Pradesh, and Visakhapatnam in Andhra. In carrying out these programmes there were certain shortfalls. These were mainly due to shortage of trained personnel, inadequate organisation and planning, and lack of materials, particularly, galvanised iron pipes, pump sets and related accessories.

13. As a result of the experience of urban water supply schemes during the Second Plan, three main suggestions may be made. In the first place, urban water supply schemes, specially the larger ones, need to be phased carefully, so that different parts of a project are in the correct sequence with one another and at each stage certain returns on the outlays incurred are realised. The technical scrutiny of plans and estimates is important if delays are to be avoided. Secondly, to ensure that the funds available are used to the best advantage it would be desirable to avoid dispersing them too thinly over a large number of schemes. This implies careful selection of urban water supply schemes on the basis of suitable criteria. Thirdly, once a project is accepted, the municipal body concerned should not only accept responsibility for maintenance but also contribute to the cost of construction to an extent which may be determined by the State Government. There is also need for well-organised Public Health Engineering Departments in all States. These Departments could ensure adequate coordination between the engineering and health aspects of various water supply schemes, whether undertaken by the State Governments or by corporations and municipalities. Where this coordination has been lacking, there have been delays in execution and maintenance has been unsatisfactory. Statutory water and sewage boards, empowered to float loans and levy cesses, and set up with the object of undertaking water supply and sewage schemes within their jurisdiction are likely to be helpful in the effective and efficient management of water supply schemes.

14. A sum of Rs. 89 crores has been provided for urban water supply and drainage schemes during the Third Plan period. The number of new schemes that can be taken up against the allocation for urban water supply is necessarily limited. Along with other water supply and drainage

21. *Malaria eradication.*—Anti-malaria measures undertaken during the first two Plans have resulted in marked decline in the annual incidence of the disease from 75 million cases in 1952-53 to about 10 million cases in 1960-61. The child spleen rate diminished from 7·7 per cent in 1956 to 1·4 per cent in 1960. Similarly, the child parasite rate decreased from 1·8 per cent to 0·2 per cent and infant parasite rate from 0·7 per cent to 0·1 per cent. By the end of the Second Plan, 390 malaria eradication units were in position. Surveillance operations have been introduced simultaneously and, as the Third Plan progresses, these units will be gradually withdrawn and only a few units will be retained, if necessary, particularly in border areas.

22. *Filaria control.*—Filariasis is prevalent mostly in coastal regions. Surveys conducted during the Second Plan have indicated that about 40 million persons are exposed to the infection in endemic areas. The method adopted for its control consists of mass chemotherapy, anti-mosquito measures and anti-larval measures. Filariasis is predominantly an urban problem and the essential effective long-term measure is the improvement of environmental sanitation. The number of control units was increased from 11 in 1956 to 48 in 1961. In the Third Plan, anti-filariasis measures will be continued, but priority will be given to drainage schemes in towns affected by this disease.

23. *Smallpox.*—Smallpox is endemic in India and is a source for the spread of infection to other countries. There has been a decline in morbidity and mortality rates from smallpox due to the vaccination campaigns which have been undertaken, but smallpox cases continue to occur during certain seasons in a year and the disease appears in epidemic form once in five or six years.

As smallpox is a preventible disease and as vaccination is a potent weapon for eradicating it, it has been agreed that during the Third Plan an effort should be made to eradicate the disease. Pilot schemes were initiated in all States during 1960-61. The principal items of the programme in the Third Plan would be (1) an increase in the output of vaccine lymph, (2) recruitment and training of vaccinators, and (3) undertaking mass vaccination to cover the entire population before the next outbreak of the disease. Action has already been initiated to increase the output of vaccine lymph.

24. *Tuberculosis.*—A sample survey conducted recently under the auspices of the Indian Council of Medical Research has shown that the total number of cases of pulmonary tuberculosis in the country was roughly 5 million, of which about 1·5 million might be infectious and that while mortality from tuberculosis is showing signs of decline, the incidence rate has remained more or less the same, both in rural and urban areas. During the Second Plan about 120 million persons were

areas, before he can cross the first efficiency bar or gain the next grade. Period of service in rural areas should be taken into consideration for accelerated promotion, advance increments or selection for post graduate training.

(ii) Residential accommodation and other facilities should be provided for medical personnel serving in rural areas. Due account should be taken of their additional expenditure e.g. on account of the education of children.

(iii) Scholarships should be made available in sufficient number to students undergoing training with the obligation that they will serve in rural areas after graduation for a minimum prescribed period.

(iv) The services of medical practitioners both in urban and rural areas should be utilised on a part time basis in the hospitals and dispensaries and for school health service.

(v) The services of qualified and properly trained graduates in indigenous systems of medicine in primary health units and sub centres in addition to the medical officer should be utilised.

18. Further, to ensure that the standard of primary health units is maintained and special services are readily made available to them, it is necessary that these units are linked up with referral and district hospitals. Specialised services are at present concentrated in hospitals in the larger cities. To bring these services within easy reach of the population of small towns and villages, it is necessary that the bed strength of district and sub-divisional hospitals is suitably enlarged and X-ray and pathological diagnostic services and medical, surgical and obstetrical specialist services are made available. Apart from the increase in hospital beds, out-patient departments should be organised as polyclinics, so that much of the technical equipment may be available and treatment afforded in the out-patient department itself.

19. The overall target for the Third Plan is the establishment of 2000 more hospitals and dispensaries and 54,500 additional beds.

Control of Communicable Diseases

20. Work on the control of communicable diseases, including malaria, filariasis, tuberculosis, smallpox, venereal diseases, leprosy, cholera and goitre will be undertaken on a larger scale in the Third Plan, special emphasis being placed on the eradication of malaria and smallpox. A total expenditure of Rs. 23 crores was incurred on the control of the communicable diseases in the First Plan and of Rs. 64 crores in the Second Plan. The Third Plan programmes entail a total outlay of about Rs. 70 crores.

The programme for the control of leprosy during the Third Plan period includes the establishment of 100 more control units and the establishment of survey, education and treament (SET) centres, besides continuing the existing programmes. A large number of voluntary organisations and social workers in antileprosy work will be associated in this programme. Every hospital and primary health unit in endemic areas would be organised as a nucleus for leprosy control work.

27. *Cholera.*—India has been an endemic area for cholera for a very long period. As has been pointed out by a recent expert committee there are five endemic foci in the deltaic regions of the principal rivers in the States of West Bengal, Orissa, Andhra Pradesh and Madras of which West Bengal and Orissa, are the more serious. To prevent frequent recurrence of cholera epidemics, these endemic foci have to be eliminated. This can be achieved only by providing adequate supply of safe water for the population, particularly in the endemic areas and by the adoption of modern methods of sewage disposal. As a practical measure attention should first be concentrated on towns and cities where the infection spreads much more easily than in the rural areas with their relatively sparse population. By far, the largest and most important endemic focus in India is Greater Calcutta which is situated at the very centre of the main endemic area of West Bengal. The existing system for the supply of filtered river water is an old one and has to be considerably extended. Only two-thirds of the city area is at present covered by a sewerage system. Improvement and modernisation of the water supply, sewerage and drainage systems of Greater Calcutta calls for careful planning and urgent action. Water supply and sanitary conditions in the Calcutta area were reviewed recently by a team from the World Health Organisation and various steps have been recently initiated.

28. For the complete eradication of cholera, water supply and sanitation have to be improved much more extensively than has yet been possible under the First and Second Plans. In the Third Plan a substantial programme for providing protected water supply is being undertaken. It is suggested that in the States affected by cholera a large part of this programme should be concentrated in the endemic pockets. Specific programmes for these areas should be drawn up speedily and, if necessary, an effort should be made to supplement resources available under the Plan. There is no reason why it should not be possible to reduce the incidence of cholera significantly during the Third Plan and to eliminate it wholly by the end of the Fourth Plan.

29. *Goitre.*—Goitre is endemic in the sub-Himalayan region. During the Second Plan period the Government of India, in collaboration with the UNICEF established a factory near Sambhar Lake in Rajasthan,

tested under the B.C.G. Vaccination Campaign. The number of tuberculosis clinics was increased from 160 in 1956 to 220 in 1961. Ten T.B. Demonstration and Training Centres were established and the number of beds for tuberculosis patients was increased from 22,000 in 1956 to 26,500 in 1961. A National T.B. Training Institute was established at Bangalore in 1959.

In the Third Plan, the B.C.G. Campaign will be intensified to cover another 100 million persons. The number of clinics will be increased from 220 to 420. In addition, 25 mobile clinics equipped with X-ray for miniature films and the mobile laboratory for collection of specimens and simple examinations will be set up for service in rural areas. Five more Tuberculosis Demonstration and Training Centres will be established. About 3500 more beds for tuberculosis patients will be added bringing the total number of beds to 30,000 by 1966. Provision has also been made for the setting up of 7 After Care and Rehabilitation Centres.

25. *Venereal diseases.*—The common venereal diseases prevalent in the country are syphilis and gonorrhoea and the incidence is fairly high in cities, ports, industrial areas and in some of the sub-Himalayan tracts and is likely to increase with urbanisation and industrialisation. By the end of the Second Plan period 75 district clinics and 8 headquarter clinics were set up. The introduction of effective methods for the rapid diagnosis and treatment of these diseases has made it possible to reduce the reservoir of infection in the population. In the Third Plan, 100 district clinics and 6 headquarter clinics will be set up and Procain Aluminium Monostearate (PAM) and antigens will be supplied free of cost.

26. *Leprosy.*—There are roughly 2 million persons suffering from leprosy in the country of whom about 20 to 25 percent are in the infectious stage. The incidence of disease varies from 0·5 per cent to 5·0 per cent. Leprosy is brought under control by intensive and extensive mass scale treatment with modern drugs, especially the sulphones. By the end of the Second Plan, 135 Study and Treatment Centres for leprosy had been set up. About 7 million persons had been surveyed and about 90,000 persons were given domiciliary treatment. The Central Leprosy Teaching and Research Institute at Chingleput has been carrying out research into various problems concerning leprosy and training the leprosy workers. The Leprosy Advisory Committee, set up in 1958, to review the leprosy control schemes has made a number of recommendations for intensifying the leprosy control work in India such as grant of special allowance, free residential accommodation, improvement in service conditions and centralised training programmes for workers in this field.

and the establishment of new medical colleges, about 2500 teachers will be needed so that the total requirement of teachers during the Third Plan will be of the order of 4500. A provision of Rs. 3·5 crores has been made in the Third Plan for the expansion of facilities for postgraduate education. This programme has a very high priority and should be completed in the early years of the Third Plan.

34. *Dental education.*—There are at present 10 dental colleges with a total annual admission of about 280. During the Third Plan 4 new colleges will be established and some of the existing colleges will be expanded. This will raise the annual admission to 400 per year. Provision has also been made in the Third Plan for the opening of dental clinics and for dental research.

35. *Medical research.*—Research programmes in the Second Plan were drawn up on the basis of the recommendations of the Indian Council of Medical Research. These include research in communicable diseases, particularly tuberculosis, trachoma, leprosy, cholera and virus diseases. The study of nutritional disorders and diseases received special attention. Studies with a view to developing methods for preventing pollution of rivers and streams by industrial wastes were carried out. Research on diseases of viral origin has also been undertaken. Programmes for medical research to be carried out in the Third Plan have been described in the Chapter on Scientific and Technological Research. Priority will be given to the study of problems of environmental sanitation and communicable diseases. Special attention will be devoted to training of research workers in different fields in sufficient number. Research on indigenous medicine will be intensified.

Training of Ancillary Personnel

36. Although since the beginning of the First Plan, steps have been taken to expand training facilities for nurses and other ancillary personnel, shortages have continued to be acute. The relevant statistics of the progress made and the targets for the Third Plan are set out in Table 3. The problem is proposed to be dealt with in the Third Plan along the following lines.

(i) *Nurses.*—To improve the condition of service for nurses and to attract larger numbers of women to this profession it is proposed that in each State, there should be a special Nursing Service and a Nurse Superintendent should advise and assist the Director of Health Services. It is also proposed that competent and experienced Nursing Sisters should be appointed in hospitals.

(ii) *Auxiliary nurse midwives.*—Auxiliary nurse midwives go through a two-year course of training. The aim is that they should eventually replace midwives in primary health units and elsewhere. Training facilities are being considerably stepped up in the Third Plan.

to manufacture iodised|iodated salt for distribution in some endemic districts of the Punjab. This factory is capable of producing iodised salt to meet the requirements of a population of 2·7 million, that is, about a third of the population at risk. To eliminate goitre completely, the production of iodised salt has to be increased and two more plants need to be installed.

30. Provision has been made in the Third Plan for the treatment and control of trachoma. Facilities for the early diagnosis of cancer and for research in this field will be expanded under the Third Plan.

MEDICAL EDUCATION AND RESEARCH

31. Statistics relating to the expansion of training facilities for medical and para-medical personnel during the first two Plans have been set out in table 3. In the Third Plan, training facilities in medical colleges and attached hospitals will be expanded further and 18 new medical colleges will be established, bringing the total number to 75. Separate Departments will be established in all medical colleges for the study of social and preventive medicine. The development programme of the All India Institute of Medical Sciences will be completed and in several medical colleges certain departments will be upgraded and facilities for postgraduate training and research will be established.

32. The expansion of training facilities for doctors in the first two Plans has barely kept pace with the growth of population, the population-doctor ratio remaining at 6000 : 1 over the decade 1951-61. This ratio will remain unchanged under the programme for the Third Plan, in formulating which the shortage of teachers in the existing medical colleges has had to be taken into consideration. Reference has already been made to the shortage of doctors for work in rural areas and to steps necessary for removing this deficiency. A further measure which is recommended is that a new short-term course for the training of "medical assistants" should be instituted at an early date. The trainees should work in primary health units in the rural areas for periods of 3 to 5 years after which they should be given special facilities to obtain the normal medical qualifications and continue in the public service.

33. *Postgraduate medical education.*—With the rapid expansion of medical colleges and the establishment of new colleges, there will be increased demand for teachers. A larger number of students have to be trained in various subjects to the postgraduate level to take up teaching positions in medical colleges. The existing facilities available for postgraduate education are adequate for an annual average intake of about 750 students and the out-turn may be of the order of 250. It is estimated that there is already a shortage of about 2000 teachers in the existing medical colleges. For the anticipated expansion of these colleges

set up such Bureaux. Among the most important aspects of health education are personal hygiene, environmental sanitation, prevention of communicable diseases, nutrition, physical exercise, marriage guidance, pre-natal and post-natal care, maternity and child health, etc. Health education should be undertaken as a national programme and far greater stress should be placed upon it in the work of social education in community development blocks. The Third Plan provides for increase in facilities for training in health education and for demonstration and publicity. Both in urban and rural areas there is considerable scope for orienting the existing health programmes, so as to assure for them a sound base in widespread health education.

HEALTH INSURANCE

40. A beginning with health insurance has been made with the provision of health and medical facilities for industrial workers under the Employees' State Insurance Scheme and for the employees of the Central Government in Delhi under the Contributory Health service Scheme. In the light of the experience gained, other schemes of this nature should be worked out by the Central and State Governments, so that over a period a comprehensive system of contributory health insurance, which serves a large part of the population, can be established. It is proposed to study further various problems which arise in this connection with a view to evolving phased programmes for implementation.

SCHOOL HEALTH

41. At the end of the Second Plan, 44 million children were at school; in the Third Plan this number will go up by 20 million. About 50 million children of the age group 6-11 will be in school by the end of the Third Plan. Care of the health of such large numbers of children is not only vital in itself, but is a most important aspect of the health of the community as a whole. As the School Health Committee, which submitted its interim report about a year ago, pointed out, the incidence of sickness and disease among school children due to malnutrition and other preventive causes is extremely high. It is suggested that the Health programmes drawn up for the Third Plan in the States should ensure certain minimum services for the care of health in the schools. These are: (1) clean drinking water and sanitary facilities in schools, (2) arrangements for medical inspection, (3) follow up services in association with the primay health unit in the development block. and (4) instruction of teachers in health education.

In view of the importance of school midday meals for the health and nutrition of children, specially for those coming from the poorer homes. as suggested in the chapter on Education, this programme should be extended progressively as local communities come forward to contribute

(iii) *Health visitors.*—The Plan as at present formulated envisages increase in the number of training institutions for health visitors from 30 to 50, the annual intake rising from 650 to 850. Considering the existing shortage of health visitors and the important role assigned to them in the rural health services, the training facilities need to be augmented to a much greater extent. It is suggested that the present training programmes in the States should be reviewed at an early date in relation to health visitors as well as other women workers required for implementing the rural health programme.

(iv) *Dais.*—Child births in rural areas are attended to mostly by dais. They, however, lack training. The general object is to give to dais a measure of reorientation and training to enable them to render better service in the villages. Provision for such training is being made in the Plan.

37. *Public health engineers.*—In the Third Plan, training facilities are being expanded for public health engineers, subordinate personnel as well as water works operators. In these categories, personnel are required in increasing number on account of the programmes for urban and rural water supply.

The Plan also provides for training of Sanitary inspectors, laboratory technicians, refractionists, opticians and radiographers and for workers in leprosy, venereal diseases and tuberculosis. Facilities for training in health statistics are also being arranged.

38. *Pharmacists.*—The education of pharmacists is regulated under the Pharmacy Act, 1948, which was passed with the object of raising standards of training required for pharmacists who work in hospitals and dispensaries. The replacement of "compounders" who are now commonly employed for dispensing medicines by trained pharmacists will be necessarily a long-term process. It is, however, important that of the additional personnel required in the Third Plan, estimated at about 6000, as large a proportion as possible should be trained pharmacists. On the present plans there appears to be a gap of about 2000, which can be made up, in the main, through the further expansion of the existing training institution.

Health Education

39. In its widest sense health education is the very foundation of a successful public health programme. As was suggested in the First Plan, a great deal of ill health is the result of ignorance of simple rules of hygiene or of indifference to their practical application, and no single measure is likely to give a greater return in proportion to the outlay than health education. To implement the programme of health education, the Central Health Bureau was established in 1956 in the Directorate General of Health Services and several States have also

counselling for simple personal and emotional problems, mental health education of parents and teachers on sound principles of child upbringing and training in mental hygiene of school teachers should find an appropriate place in the school health programme. In view of the role of psychological factors in social life, mental hygiene measures should be regarded as a necessary element in the administration of social welfare programmes. Since so little is known regarding the new social and psychological problems which are coming up as India's economy develops and becomes ever more complex, facilities should also be provided for special surveys and studies in mental health. Voluntary organisations can help greatly in educating the general public, in supporting the work of child guidance clinics and in other ways.

VITAL STATISTICS

44. It has long been recognised that deficiencies in vital statistics are among the more serious weaknesses of the existing statistical system. The problem was discussed at length in the First Five Year Plan, but over the past decade comparatively little progress has been made. The subject was considered in all the aspects at an inter-State conference in April, 1961. It has recommended that Central legislation should be enacted for vital statistics, in which there should be common definition of vital events, provision for compulsory registration and duties of Registrars, forms for reporting vital statistics and penalties should be laid down, leaving it to State Governments and Union Territories to provide for the administrative machinery and other details of implementation. Suggestions were also made regarding arrangements appropriate to municipal areas, areas notified under the State Panchayat Acts and other rural areas, appointment of District Registrars, flow of returns and compilation of statistics. It was further proposed that in addition to an annual sample census to estimate the growth of population and other measures of demographic characteristics, a scheme of sample registration of areas should be worked out with a view to obtaining reliable estimates of birth and death rates for different States and regions. These recommendations are at present under consideration. It is essential that the programme for the improvement of vital statistics should be implemented in the States as speedily as possible with such further support from the Centre as might be found necessary.

DRUGS

45. The Third Plan envisages a large increase in the production of drugs in the country and replacement of imported drugs and raw materials by indigenous manufactures. In the past, quality and standards in drugs were based in the main on imported drugs but, with the virtual stoppage of imports and development of internal production, the Indian

towards it. In due course the movement for midday meals should cover the bulk of the school population, specially in the lower age groups.

MATERNAL AND CHILD HEALTH

42. At the end of the Second Plan there were nearly 4500 maternity and child welfare centres, each serving a population varying between 10,000 and 25,000. One third of these centres are located in urban areas. As a result of improvements in maternity care affected during the first two Plans, the maternal mortality rate which was as high as 20 per thousand live births in 1938 is now estimated to have come down to 12·4 per thusand live births. There has also been a general reduction in the incidence of severe cases of anaemia in areas where antenatal services are well established and there has been a steady decrease in the infant mortality rate. During the Second Plan, maternity and child welfare services became an integral part of the over-all health services in rural areas. Maternity and Child Welfare Buréaux have been established in most of the States. Steps were also taken during the Second Plan to improve training in paediatrics. Facilities for the teaching of paediatrics in medical colleges have been expanded in recent years. Maternity and child welfare services provided by the primary health centres are supplemented by services provided by welfare extension projects and by voluntary organisations.

During the Third Plan it is proposed to link up the maternity and child health services associated with the primary health units with extended facilities in referral and district hospitals. Short orientation courses will be arranged at these hospitals for personnel engaged in maternity and child health work.

MENTAL HEALTH

43. The recent constitution by the Central Government of an Advisory Committee on Mental Health points to the growing importance of mental health services in programmes for the development of public health and medical facilities. Besides making curative services available in mental hospitals to the extent feasible, greater attention has now to be given to the provision of preventive mental hygiene services and, in particular, to the introduction of a range of training programmes. Rapid industrialisation, technological changes and the movement of population from rural to urban areas bring in their train certain tensions and problems of maladjustment which are best dealt with in their early stages. There is need for mental health orientation of medical specialists, public health personnel and social workers, specially those working in maternity and child health centres. Mental health education is also an important aspect of the health education programme. Training facilities are required on a steadily increasing scale for child psychiatrists and psychiatric social workers. In the field of education,

Food Adulteration

47. The supply of pure food is an obligation which all producers and distributors owe to the community and which can and must be enforced rigorously. Yet, from such evidence as is available, the position has tended to deteriorate, and adulteration in such articles of common consumption as ghee, milk, oils, and fats, spices and condiment, flour, pulses, etc. occurs all too frequently in the towns and also increasingly, in the rural areas. Indeed, methods of food adulteration tend to become progressively more elaborate and more difficult to detect. Problems of food adulteration have been recently considered by the Central Council of health and at a special seminar, and a series of suggestions have been put forward. These include proposals for deterrent punishment under the Prevention of Food Adulteration Act, 1954; strengthening of the machinery for inspection of foodstuffs and of the available laboratory facilities, and improvement and speeding up of administrative and other procedures connected with food offences. Recommendations have also been made regarding the standards to be observed in respect of different articles of consumption. Adulteration occurs at the point of production, in the stage of processing and in the course of distribution, both wholesale and retail. It is important that besides being dealt with where it touches the consumer, the problem should be followed up systematically for each commodity through each of the earlier stages, and all the parties concerned should be brought within the scope of legal and administrative action. Local bodies, voluntary organisations and consumer associations should be encouraged to expose the evildoers, and the authorities concerned should give the utmost attention to public complaints. It is also essential, as suggested in the Chapter on Cooperation, that cooperative consumer stores should be built up, specially in the towns, as a means of assuring the supply of pure foodstuffs.

Indigeneous Systems of Medicine

48. Work on indigenous systems of medicine has developed steadily during the past decade. For the promotion of research in indigenous systems a sum of about Rs. 38 lakhs was spent during the First Plan. Research programmes in this field were considerably expanded in the Second Plan, the total expenditure incurred being about Rs. 4 crores. In 1959, the Central Council of Ayurvedic Research was set up to advise the Government of India on the formulation of a coordinated policy for research in Ayurveda throughout the country and on steps to be taken for stimulating research. Two advisory committees, one on Homeopathy and the other on Unani, were also set up. The Central Institute of Research in Indigenous Systems of Medicine which was established at Jamnagar in 1953, has undertaken clinical research in certain selected diseases and identification of crude ayurvedic drugs, plants and herbs and problems connected with their cultivation. In addition to its ayurvedic and

Pharmacopoeia and the National Formulary will become the basis of standards in drugs and the development of the industry. The quality of drugs, both imported and manufactured is controlled under the Drugs Act, 1940. This law is in force in all the States but generally, it is not being adequately implemented. In part this deficiency is due to inadequacy of staff and to want of proper facilities for analysing samples of drugs taken from manufacturers and traders. Under a recent amendment of the legislation, the Central Government has taken concurrent powers with the States over the manufacture of drugs. The services of the Central Drugs Laboratory at Calcutta, have been placed at the disposal of the State Governments, but it is also essential that the State Governments should themselves provide for the establishment of their own laboratories for analysis of samples. The Central Government has appointed a skeleton staff for the control of manufacture of drugs concurrently with the State Governments, but it will also be necessary for the State Governments to take early steps to augment their present personnel for the day to day administration of the legislation. At present too few samples are taken and long delays occur in their analysis.

While staff and facilities for analysis have to be made available, it is equally essential that manufacturers and trade associations should be induced to play a fully responsible role in maintaining quality and standards. Consumer associations, local bodies and voluntary organisations should bring deviations from standards and excessive prices to the attention of the general public and of the authorities concerned.

46. While the prices of many essential drugs are being maintained at reasonable levels, those of proprietory brands, specially of products of foreign origin or composition which are distributed by Indian agents or subsidiaries of manufacturers abroad, are often excessive, and large profits are made. This situation has to be remedied, as far as possible, with the help of the manufacturers and distributors concerned. It is also essential that Indian manufacturers, the medical profession and the State Governments should follow the directions set out in the National Formulary, which will be revised at regular intervals and maintained up-to-date. To create confidence among the public in products marketed under non-proprietory names, State Governments should strengthen measures for quality control and ensure adequate arrangements for inspection.

A proportion of the drugs sold in the market, specially biologicals, are of sub-standard quality. Spurious drugs are also being frequently sold. The Drugs Act has been amended recently, and a minimum punishment of one year's imprisonment has been prescribed for the manufacture and sale of spurious drugs.

awareness of the problem. With the increase in production and improvement in economic conditions envisaged for the Third Plan, a systematic approach to the problem of nutrition should now be feasible. It will doubtless take time to bring about substantial changes but, if programmes are conceived from the beginning on correct lines, the right priorities are set, and each community begins to realise the significance of nutrition and the contribution which it can itself make by its own effort and resources, over a period, considerable results can be achieved.

The broad features of the problem of nutrition are well known. Generally, in most parts of India, the diet is composed of cereals and is lacking in protective and body-building foods such as milk, meat, eggs, vegetables and fruit. Diet surveys undertaken at the instance of the Indian Council of Medical Research over two periods, 1935—48 and 1955—58, show that while there has been no appreciable change in the consumption of cereals and pulses, there may well have been a small reduction in the consumption per capita of some of the non-cereals foods. Food deficiencies bear most harshly on growing children among the poorer sections of the population. Over a large area at the foothills of the Himalayas endemic goitre results from iodine deficiency. Other important elements in the problem are the loss of nutritive elements in food, due to the adoption of wrong methods of cooking, as in rice and vegetables and of processing as in rice milling, waste of fruit and fish, on account of lack of transport and refrigeration facilities, and diversion to low priority uses as in the case of milk used in the preparation of sweets. Thus, over the first two Plans there has been no significant increase in the average per capita consumption of milk, which is at present estimated at 4·9 oz. per day as against the minimum requirement of 10 oz. for a balanced diet. The total production of fish has risen from about 700,000 tons to 1·4 million tons, and programmes in the Third Plan provide for increase in the production of fish to 1·8 million tons. Possibilities exist, however, of securing larger increases in production through more effective organisation of the fisheries industry, and efficient implementation of various development programmes. It should also be possible to bring into use to a much larger extent than at present subsidiary foods such as potatoes, sweet potatoes and tapioca, leafy and other vegetables and fruits like papaya and banana which are easily grown, products like palm gur and honey, and processed foods such as have been developed with success at the Central Food Technological Research Institute, Mysore.

56. At the present stage of development the programme for improving nutrition falls broadly under two heads, namely, education of the public and of various groups of workers in nutrition, and measures to meet the nutritional requirements of vulnerable groups within the community. Information and guidance about nutrition, about conserving the nutritive elements in food and avoiding wrong uses and wastage,

of indigenous systems of medicine. The programme of development which has been drawn up includes the opening of five new colleges, expansion of 31 existing colleges, research in pharmaceutical products, opening and upgrading of 1800 dispensaries and hospitals, improvement of pharmacies and the establishment of herbaria. It is well known that a large number of indigenous drugs are in common use in the households. It is proposed during the Third Plan to establish herbaria with a few selected herbs locally available in the first instance in individual development blocks.

52. *Nature Cure.*—The Nature Cure treatment has been in vogue from times immemorial in India and in other countries. Modern medicine has incorporated many of its techniques for the treatment of several disabilities. This process can be continued even further. The significance of nature cure should be considered more as a way of life than as a system of medical treatment in the narrow sense. Its emphasis on the preventive aspect of disease, promotion of general health, vitality and spirit of self-help through simple ways of living deserves better appreciation. During the Third Five Year Plan the existing nature cure institutions will be assisted to equip themselves with pathological laboratories, so that modern scientific methods can be utilised for placing nature cure treatment on a more sound footing.

53. *Homeopathy.*—The Central Government have given grants for upgrading, improving and setting up homeopathic institutions and for research. An Advisory Committee on Homeopathy has been constituted by the Ministry of Healtth. The question of establishing facilities for the manufacture of homeopathic drugs and of a laboratory for standardising the drugs is being considered in consultation with this Committee. In the Third Plan, provision has been made for giving grants to homeopathic institutions and for carrying out research. The possibility of utilising properly trained and qualified homeopaths for service in urban and rural areas needs to be explored.

Proposals for the opening of homeopathic colleges and hospitals have been made and should be considered further.

54. *Unani.*—The Government of India have constituted an Advisory Committee on the subject under the Ministry of Health. Grants are being given to institutions for the purpose of research, upgrading, improvement and establishment of unani institutions.

Nutrition

55. In plans for the improvement of health conditions better nutrition holds a crucial place. During the first two Plans there has been no concerted effort to improve nutrition, change food habits or create great

II

FAMILY PLANNING

58. In recommending the programme of family planning, the First Five Year Plan stated:

> "It is apparent that population control can be achieved only by the reduction of the birth-rate to the extent necessary to stabilise the population at a level consistent with the requirements of national economy. This can be secured only by the realisation of the need for family limitation on a wide scale by the people. The main appeal for family planning is based on considerations of health and welfare of the family. Family limitation or spacing of the children is necessary and desirable in order to secure better health for the mother and better care and upbringing of children. Measures directed to this end should, therefore, form part of the public health programme".

In pursuance of the policy outlined above, there has been a steady expansion of activities in the field of family planning especially in the Second Plan. The programme for the Third Plan has been recently considered by a special committee appointed by the Ministry of Health and by the Planning Commission's Panel on Health.

59. In the Chapter on Long-term Economic Development, certain provisional estimates of increase in population over the next fifteen years have been cited, and it has been stated that the objective of stabilising the growth of population over a reasonable period must be at the very centre of planned development. In this context, the greatest stress has to be placed in the Third and subsequent Five Year Plans on the programme of family planning. This will involve intensive education, provision of facilities and advice on the largest scale possible and widespread popular effort in every rural and urban community. In the circumstances of the country, family planning has to be undertaken, not merely as a major development programme, but as a nation-wide movement which embodies a basic attitude towards a better life for the individual, the family and the community.

60. During the First Five Year Plan, 126 family planning clinics were set-up in urban areas and 21 in rural areas. In the course of the Second Plan, the number of clinics increased to 549 in urban and 1100 in rural areas. In addition to these clinics, family planning services are provided at 1864 rural and 330 urban medical and health centres. A number of sterilisation centres have also been established. The programme is guided by the Central and State Family Planning Boards. All States have set-up special units for family planning work. Considerable amount of research

should be made widely available through demonstrations and the work of voluntary organisations and mahila mandals in the villages as part of the community development programme. At the same time, groups such as doctors, nurses, health visitors, school teachers and others should receive special short-term training in nutrition. Among the vulnerable groups, those requiring the greatest attention are expectant and nursing mothers, infants, pre-school children and school children, specially in the lower age groups. School children are best catered for through the mid-day meal programme to which reference has been made earlier. For under-nourished children the provision of protective foods like milk and additions to the diet through multi-purpose food, vitamins, etc., are essential. Greater attention should also be given to the provision of cheap and balanced meals in canteens in industrial undertakings, hostels in schools and colleges, and in restaurants and eating places for the general public.

To carry out programmes such as these, public health nutrition services at the Centre and in the States need to be better equipped. At the Centre there is already a National Nutrition Advisory Committee. The establishment of special sections for nutrition in the Public Health Departments in the States has been repeatedly urged. At the State level there must be the closest coordination, as in a vital common effort, on the part of the Departments of Health, Agriculture, Animal Husbandry, Dairying, Fisheries, Education, Social Welfare and Publicity. At the district and block level a well-designed programme for improving nutrition can secure increasing public support and appreciation as well as the help of voluntary workers and organizations. Proceeding on these lines, in the course of the Third Plan, it should be possible to lay solid foundations for popular and steadily growing effort to improve nutrition and the general health of the community, and especially of its vulnerable and weaker sections.

Planning for the Future

57. Far-reaching developments have occurred in the field of health since the Health Survey and Development Committee (Bhore Committee) submitted its comprehensive report fifteen years ago. It is important that, besides being closely integrated with programmes in other fields, plans for the development of health services should be conceived with a clear perspective for the future, specially over the next three plan periods. In June 1959, the Ministry of Health set up the Health Survey and Planning Committee for assessing and evaluating developments in medical relief and public health since Independence and formulating recommendations for the future plan of health development. The Committee is at present engaged in a careful study of the problems of rural and urban medical relief, public health, including environmental hygiene, control of communicable diseases, professional education and research, population and family planning, and drugs and medical stores.

specially those rendered through the primary health centres. To an extent such services might also be made available through centres maintained by voluntary agencies, mobile units and industrial and other establishments. According to the tentative programmes drawn up for the Third Plan, the number of family planning clinics is likely to increase from about 1800 at the end of the Second Plan to about 8200. Of the latter, about 6100 clinics may be in rural areas and 2100 in urban areas. Distribution of simple contraceptives and general advice could be entrusted in a much larger measure to voluntary organisations, to paramedical personnel and to dais specially trained in family planning work. The additional personnel and other expenditure required for enabling every primary health centre to provide family planning services is proposed to be incorporated in an integral manner into the programme for primary health centres. The main difficulty here is of securing the requisite trained personnel specially women workers. For expanding training facilities, it is essential to organise a large number of intensive short-term courses. In the urban areas, it is proposed that greater use should be made of private medical practitioners in providing advice, distributing supplies and, to the extent possible, in undertaking sterilisation.

64. A large-scale family planning programme has to be supported necessarily by indigenous manufacture of contraceptives. In this respect, although there has been some progress, the situation cannot be said to be satisfactory. The estimates of supplies, which have been current hitherto, are based on a programme of very small dimensions. In view of the nature of the programme, it is considered that it will be necessary for the Government to take initiative in prescribing standards and specifications, determining prices, and also participating increasingly in production. In the early stages and for certain sections of the population, the provision of supplies free of cost and at subsidised rates will also be necessary. It is recommended that detailed plans for the production of contraceptives, both by Government and by private firms, should be drawn up as a matter of high priority, keeping in view the objective that, as rapidly as possible, supplies will in fact become available on the scale needed.

65. An expanded programme of research is to be undertaken in the Third Plan. Amongst others, the following aspects are being investigated:

(i) Development of studies of human genetics.
(ii) Studies in the physiology of reproduction.
(iii) Development of more effective local contraceptives.
(iv) Development of a suitable oral contraceptive.
(v) Follow-up of sterilisation cases, both male and female, to investigate possible after-effects in such cases.

work is in progress at the Contraceptive Testing Unit at Bombay and elsewhere under the guidance of the Indian Council of Medical Research and at the All India Institute of Hygiene and Public Health, Calcutta. Demographic research centres have been set-up in Bombay, Calcutta, Delhi and Trivandrum. A number of valuable field investigations have been carried out, such as the India-Harvard-Ludhiana population study and the studies undertaken at Ramanagaram in Mysore, in the Lodi Colony in Delhi, at Najafgarh near Delhi, and at Singur near Calcutta. A broad based training programme has been developed which includes centres for training of instructors, a rural training demonstration and experimental centre, development of training clinics into regional training centres, touring training teams and ad hoc training courses. Family planning has also been incorporated in the normal training programme of a number of teaching institutions for doctors and medical auxiliaries. As against Rs. 65 lakhs in the First Plan, a financial provision of Rs. 5 crores was made in the Second Plan.

61. The programme for family planning in the Third Plan provides for (a) education and motivation for family planning, (b) provision of services, (c) training, (d) supplies, (e) communication and motivation research, (f) demographic research, and (g) medical and biological research. The programme as approved, involves a total outlay of Rs. 50 crores. Clearly, the limitations of a programme of the nature of family planning arise not from finance, but essentially from considerations of organisation, and personnel, which affect the scale and intensity at which the programme can be implemented.

62. Various studies suggest that there is already considerable awareness of the need for family limitation and desire for practical help and guidance. This does not mean that the difficult problems of communication and motivation have been overcome or that in terms of advice and organisation much more than a beginning has been made, in particular, in approaching rural communities. It is to these aspects that much greater attention should be given in the Third Plan. The intensification of the educational programme is crucial to the success of the entire movement. Family planning education, being part of education for a better life, has to be interwoven with other constructive activities, especially the work of the primary health centres, community development blocks and voluntary organisations. Information has to be made available on the largest possible scale and conditions created in which individuals can freely resort to family planning.

63. Family planning services have to be made available much more widely than at present. In this, the central feature must be the integration of family planning with the normal medical and health services,

CHAPTER XXXIII

HOUSING AND URBAN AND RURAL PLANNING

THE housing programme which had its beginning in the First Five Year Plan was directed mainly towards housing for industrial workers and low income groups. The programme was considerably expanded during the Second Five Year Plan with the introduction of schemes of slum clearance and slum improvement, plantation labour housing, village housing and land acquisition and development. The Table below shows the anticipated expenditure in the Second Plan:

Table 1: Anticipated expenditure in the Second Plan

scheme	(Rs. crores) anticipated expenditure
subsidised industrial housing	24·2
slum clearance	9·9
low income group housing	37·8
village housing	3·7
plantation labour housing	0·1
middle income-group housing in Union Territories	0·3
state housing schemes	1·2
land acquisition and development	2·0
town planning	1·1
total	80·3

2. Besides the housing schemes mentioned above, a few other specific schemes designed to benefit sections of the community like scheduled castes, scheduled tribes and backward classes in rural areas, handloom weavers, displaced persons etc., were undertaken. The housing programme for workers in the coal and mica industries was implemented with resources provided by the labour welfare funds for these industries. During the Second Plan the Life Insurance Corporation began to provide funds for house building to middle income groups and to State Governments for undertaking rental housing for their low paid employees. Housing on a considerable scale was also undertaken by the Central Government Departments and public enterprises for their employees. The total outlay on public housing during the Second Plan was of the order of Rs. 250 crores and about 500,000 houses were constructed.

An expert committee on oral contraceptives has been appointed to review periodically the developments in this field and to make recommendations. A committee to guide communication, motivation and action-research in family planning has also been recently set up. Studies of the sociological problems involved in family planning need to be developed on more comprehensive lines than has been hitherto attempted.

66. Over the past five years, facilities for sterilisation operations have been extended in several States and about 125,000 operations have been carried out. Within the programme of family planning, sterilisation undertaken on the basis of voluntary choice has a valuable contribution to make. It is visualised that during the Third Plan facilities for sterilisation will be extended to district hospitals, sub-divisional hospitals and to such primary health centres as have the necessary facilities for surgical work. With the help of mobile units, these facilities can be extended further.

67. The main task in the field of family planning in the Third Plan is to find effective solutions to certain basic problems and to mobilise all the available agencies for educational and extension work in support of family planning. Administrative arrangements at the Centre and in the States will need to be greatly strengthened. To equip thousands of primary health centres and in due course their sub-centres as well, with personnel and supplies, and to be able to reach out to the villages not merely with advice but more positively with the means to practise family planning, are tasks whose magnitude and complexity should not be under-estimated. To utilise such diverse agencies as private medical practitioners, indigenous doctors and village dais for family planning work along with the family planning clinics and the primary health centres will call for most careful planning at the local level. The organisation of production of contraceptives on the scale needed is another major undertaking. It is essential that the help of voluntary organisations, labour organisations and other associations in various fields of national life should be sought on as large a scale as possible and integrated into the practical programmes of work adopted in each area.

68. Finally, it should be added that besides the facilities which are undoubtedly needed, in any large-scale effort to limit families there should be the greatest emphasis on moral and psychological elements, on restraint and on such social policies as education of women, opening up of new employment opportunities for them and raising of the age of marriage. In addition to advice on birth control the family planning programme should include sex and family life education and advice on such other measures as may be necessary to promote the welfare of the family.

OUTLAY AND TARGETS

6. For housing and urban development programmes, the Third Five Year Plan provides Rs. 142 crores as against the revised outlay of Rs. 84 crores in the Second Plan. In addition, funds for housing are also expected to be provided by the Life Insurance Corporation, whose contribution is estimated at about Rs. 60 crores. The distribution of the outlay for various schemes in the Third Plan is shown below:

Table 2: Outlay in Third Plan—1961-66

scheme	(Rs. crores) outlay
(*i*) Ministry of Works, Housing and Supply	
subsidised industrial housing	29·8
dock labour housing	2·0
slum clearance, slum improvement and construction of night shelters	28·6
low income group housing	35·2
middle income group housing in Union Territories	2·5
village housing	12·7
plantation labour housing	0·7
land acquisitio and development	9·5
provision for experimental housing, research and statistics	1·0
total	122·0
(*ii*) other schemes	
States' housing schemes	2·3
town planning including preparation of master plans	5·4
urban development schemes	12·3
total	20·0
programmes included in the Plan (i & ii)	142·0
(*iii*) programmes to be financed from the funds expected to be provided by the Life Insurance Corporation	60·0
grand total	202·0

The following are the main targets proposed for the Third Plan:

Table 3: Targets in Third Plan

	number of houses/ tenements
subsidised industrial housing	73000
low income group housing	75000
slum clearance	100000
village housing	125000

7. Besides the provision for housing mentioned above, there are certain additional housing programmes financed from other sources. The coal

3. Although efforts on an increasing scale have been made in housing during the First and Second Plans, the problem of catching up with the arrears of housing and with the growth of population will continue to present serious difficulty for many years to come. Between 1951 and 1961 there was an increase in population of nearly 40 per cent in towns with a population of 20,000 or more. It was reckoned in the Second Plan that the shortage of houses in urban areas might increase by 1961 to about 5 million as compared to 2·5 million houses in 1951.

4. The growth of population and, in particular, of the urban population suggests at least three general considerations in relation to the directions in which housing programmes should be developed during the Third and subsequent Five Year Plans. Firstly, housing policies need to be set in the larger context of economic development and industrialisation, both large-scale and small-scale, and the problems likely to emerge over the next decade or two. Proposals relating to location and dispersal of industries will, therefore, be of increasing importance in the solution of the housing problem. In the second place, it is necessary to coordinate more closely the efforts of all the agencies concerned, whether public, cooperative or private. The need to undertake the preparation of master plans for urban areas becomes all the greater, for without these plans there is no means of bringing together and maximising the contribution of different agencies towards well-defined common objectives pursued systematically over a long period. In the third place, conditions have to be created in which the entire programme of housing construction, both public and private, must be so oriented that it serves specially the requirements of the low income groups within the community. In working out the housing programmes for the Third Plan an attempt has been made to bear these considerations in mind.

5. The housing schemes, which have been operating in recent years, namely, those relating to subsidised industrial housing, low income group housing, slum clearance, plantation labour housing, land acquisition and development and village housing will be continued and expanded in the Third Plan. There will be special emphasis on land acquisition and development as this is basic to the success of all housing programmes. New programmes for housing economically weaker sections of the community, dock labour and pavement dwellers will also be taken up. Concerted efforts will be made to prepare master plans and regional development plans of metropolitan and industrial cities and resource regions. Provision has also been made in the Third Plan for undertaking experimental housing and research in building techniques and for collecting housing statistics, the absence of which has been a great handicap in the past.

Land Acquisition and Development

10. Availability of building sites in sufficient numbers and at reasonable rates is essential for the successful implementation of the housing programme. During the Third Plan, therefore, a fair share of the resources available for housing is being devoted to land acquisition and development. A scheme was introduced in 1959 for giving financial assistance to State Governments in the shape of loans repayable over a period of 10 years for acquiring and developing lands in selected places. The land acquired is to be utilised for house building under different schemes and for the provision of related community facilities like parks, playgrounds, schools, hospitals, shops, post offices etc. In the Third Plan a programme entailing an outlay of Rs. 26 crores (inclusive of the contributions to be made by the Life Insurance Corporation) is envisaged for land acquisition and development. The resources made available under this programme could serve as nuclei for 'revolving funds' in the States and be utilised for bulk acquisition and development of land.

Housing of Industrial Workers

11. Under the subsidised industrial housing scheme which was formulated in 1952 for providing housing to industrial workers employed in factories and mines, mainly in the private sector, the Central Government provides to State Governments, State Housing Boards and municipal bodies 50 per cent of the cost as loan and 50 per cent as subsidy. Industrial employers and cooperative societies of industrial workers are given financial assistance to the extent of 75 per cent and 90 per cent respectively, the extent of subsidy in both cases being 25 per cent. To enable industrial workers to provide the remaining 10 per cent of the cost, they have been allowed to draw non-refundable loans from their provident fund accounts. By the end of the Second Plan, the construction of about 140,000 tenements costing Rs. 45 crores had been approved. About 100,000 tenements had been completed and the rest were under different stages of construction.

12. The scheme should have made greater progress if even the subsidised rate of rent had not proved a comparatively high charge for workers, with the result that in some areas the tenements which have been constructed have not been occupied by industrial workers. The question of bringing down the rent so that it should be within the paying capacity of workers needs further study. Along with it, arrangements should be made to provide cheap transport for taking workers to their places of work. Certain aspects of the scheme have been revised already. Workers have a larger measure of choice as between different types of accommodation. Open developed and demarcated plots of land along with some

and mica mine welfare funds are expected to provide in the Third Plan about Rs. 14 crores for the construction of 60,000 houses. The programme for the welfare of backward classes includes allotments for housing. Tentative estimates of the Ministries of Railways, Commerce and Industry, Communications and others suggest that over the plan period they may build about 300,000 houses for their employees at an approximate cost of Rs. 200 crores. Broadly, in the course of the Third Plan, under various housing schemes and the construction programmes of Ministries, 900,000 houses might be constructed as compared to about 500,000 in the Second Plan.

8. In the private sector there has been an increasing amount of construction, but it is difficult to estimate its precise magnitude.. The net investment on housing and other private construction, which was reckoned at Rs. 900 crores in the First Plan, is estimated at about Rs. 1000 crores in the Second Plan. In the Third Plan private investment on housing and other construction is placed at about Rs. 1125 crores.

Housing Boards

9. In the present stage of development, finance provided directly by Government can meet only a fraction of the demand for housing. Institutional arrangements are, therefore, required which will enable large numbers of persons, many of them with small incomes, to build for themselves. In this connection, the possibility of setting up a Central Housing Board is at present under study. Such an organisation could help to channel additional funds into housing, encourage the flow of credit on easy terms amongst other things by means of insured mortgages, improve lending practices and provide the machinery needed for the creation of a sound mortgage market in housing. It could, for instance, raise finance directly to some extent and provide loan assistance to State Governments or State Housing Boards for purchase and development of land, construction of houses and acquisition and redevelopment of slum areas. Funds obtained from the Life Insurance Corporation and from the Central Government could be channelled through it. In States where Housing Boards already exist, they generally serve as construction agencies for implementing the State housing programmes. The existence of a Central Housing Board and of Housing Boards in the States could, in due course, secure for the development of housing resources which might not be otherwise readily available. Together these institutions could assist in evolving housing policies which would facilitate construction of houses by persons of limited means for their own use and also enable banks and other financial institutions to undertake various services. It is proposed to consider these aspects further with a view to implementing the housing programmes of the Third Plan and laying the foundations for larger development in the future.

Housing of Dock Workers

14. A provision of Rs. 2 crores has been made in the Third Plan for giving loan assistance to Dock Labour Boards at Bombay, Calcutta and Madras to enable them to build houses for workers registered with them. A suitable approach might be for Government to grant loans to the extent of 80 per cent of the cost of construction. With the provision made in the Plan, it should be possible to build about 5000 houses. In recent years port development has been undertaken on a large scale, and in cooperation with the port authorities a coordinated view of the housing problems in the ports should now be taken.

Housing for Low Income Groups

15. The low income group housing scheme provides for grant of loan assistance upto 80 per cent of the cost of the dwelling, subject to a maximum of Rs. 8000, to persons whose income does not exceed Rs. 6000 per annum. Assistance on this scale is also given to local bodies, public institutions run on no-profit-no-loss basis, recognised health, charitable and educational institutions and cooperative societies.

16. Since the scheme began in 1954, loans for about 85,000 houses have been sanctioned, and by the end of the Second Plan about 53,000 houses were completed. There is considerable demand for loans under this scheme. Progress has been greater in towns where developed sites are available. It is felt that in the Third Plan special steps should be taken to enable those sections of the community which are economically weak to obtain due benefits from the scheme, such as those with an annual income of Rs. 1800 or less. Persons in this category are in a position to pay rent in the range of Rs. 10 to 12 or, at the most, Rs. 15 per mensem. The principal methods for providing housing for them would appear to be either through construction of rental housing mainly by Housing Boards and local bodies or through housing cooperatives. As a basis for further consideration, it might be possible to provide local bodies with loans at a concessional rate of interest repayable over a long period. Apart from pucca houses, the question of providing open developed plots or skeletal housing on the lines of the industrial housing and slum clearance schemes could be considered. Housing cooperatives comprising economically weaker persons could also be given similar assistance. Roughly about a third of the provision under the low income group housing scheme could be earmarked for economically weak persons. Exemptions from State and local taxes would also need to be considered. As more institutional finance for the housing of low income groups generally becomes available, a larger proportion of the funds provided by Government could be utilised for housing schemes for the economically weaker sections.

building and roofing materials can be taken up by workers, so that they may build huts of the prescribed pattern themselves. For those who do not wish to go in for 'self-built' huts on open developed plots, 'skeletal' housing with the necessary foundation, plinth and roof to form a stable structure is provided. The rent for open developed plots is about Rs. 2 to Rs. 3 per month, whereas for skeletal housing it is about Rs. 8 per month. For non-family workers hostel or dormitory accommodation is built. A few other modifications such as extension in the period of repayment of loan, increase in the ceilings of standard costs to fit in with the rise in prices of building materials and labour, liberalisation of allotment rules and provision of developed sites to employers and cooperatives have been introduced. Recently employers have been granted a concession in income-tax in the shape of an initial depreciation allowance of 20 per cent on the cost of construction of new houses for their low-paid employees, in addition to exemption for three years from payment of income tax on the rental value of small houses.

13. Despite the steps which have been taken to make the industrial housing scheme more attractive to employers, much progress cannot be achieved without the employers generally accepting the housing of a substantial portion of workers as an essential obligation. It is necessary to remember that housing conditions for industrial workers have continued to deteriorate and that without improvements in this direction efforts to increase industrial efficiency and productivity will also be affected. The problem is, therefore, one of working out arrangements for new industries as well as for the established industries which might be feasible from the financial and other aspects and would also result in an effective contribution towards the solution of the housing problem. For instance, new establishments with a prescribed limit of paid-up capital (say, Rs. 20 lakhs or more) could be placed under the obligation of constructing one-half of the housing required by their labour over a period of perhaps 10 years. In the case of the older establishments, in any specific scheme that is worked out the contribution already made by an employer to provide housing for their workers should be taken into account. In these industries also, over a period, the aim might be to ensure that about 50 per cent of the housing required is made available directly by the industries and the rest as part of the general scheme of housing development. To the extent the employers are unable to construct directly the Government or the Housing Boards may take up construction. In such cases, the employers could contribute towards the cost of construction. These and other suggestions should be considered jointly in consultation with representatives of employers and workers with a view to evolving a satisfactory scheme.

Governments and Union Territories. Loans were sanctioned to 3600 applicants and about 500 houses were constructed. Progress was comparatively small in the initial stages as this was a new scheme for which rules for the grant of loans had to be drawn up and other arrangements made. The Third Plan allocations do not provide finance for this scheme except in the Union Territories, but it is likely that from funds provided by the Life Insurance Corporation about Rs. 20 crores might become available for the middle income group housing scheme and for the rental housing scheme for State Government employees mentioned below.

Rental Housing for State Government Employees

21. The object of the rental housing scheme for State Government employees is to assist State Governments in providing housing accommodation to their low paid employees. Under the scheme, which was introduced in February 1959 the Life Insurance Corporation grants loans carrying an interest of 5 per cent per annum to State Governments, and the loans are repayable over a period of 20 years. A sum of about Rs. 7 crores was given to State Governments under the scheme during the Second Five Year Plan, and 2500 houses were sanctioned and 735 were completed.

Slum Clearance and Improvement

22. The Third Plan provides for a programme of about Rs. 29 crores for slum clearance and improvement. A scheme for giving financial assistance to State Governments and local bodies to enable them to clear some of the worst slums in big cities was initiated during the Second Plan. By the end of the Second Plan 208 projects costing about Rs. 19 crores and involving re-housing of 58,200 families living in slum conditions were taken up in different towns and cities. About 18,000 units have been already completed. For such of the families as cannot afford to pay even the subsidised rent of a pucca tenement, the scheme provides for skeletal housing and open developed plots with a separate washing platform and latrine for each family, leaving it to the slum dwellers to build huts of a prescribed pattern themselves on a self-help basis in accordance with the technical directions of the State Government.

23. Some of the difficulties which came in the way of implementation of the slum clearance and improvement programme were the lengthy and time-consuming procedures of acquisition of slum areas, non-availability and high costs of alternative sites near existing places of work, inability of the slum dwellers to pay even the subsidised rent and their reluctance to move from the areas selected for clearance. Some States like Mysore, Madras, Madhya Pradesh, Assam, Punjab, West Bengal and Delhi Administration have enacted legislation for speedier acquisition of slum

Plantation Labour Housing

17. The Plantation Labour Act, 1951, requires every employer of plantation labour to provide and maintain for all workers and their families residing in plantations, necessary housing accommodation, at the rate of at least 8 per cent of the workers every year, until all such workers have been provided for. A number of planters, particularly the smaller ones, found it difficult to discharge this obligation due to inadequacy of financial resources. Accordingly the plantation labour housing scheme was introduced in 1956 for assisting such planters as needed financial help. Under this scheme, loans are given to the extent of 80 per cent of the cost of construction of the dwelling, excluding the cost of land and its development, subject to a maximum of Rs. 2400 per house in North India and Rs. 1920 per house in South India. The planters are required to contribute the balance of 20 per cent from their own resources.

18. By the end of the Second Plan only 700 houses costing Rs. 14 lakhs had been sanctioned and 300 houses completed. The main difficulty in the way of the scheme has been the inability of the planters to furnish adequate security for the loan. The scheme requires the planters to mortgage to the State Governments land and houses built on it as security for the loan. The planters are not in a position to comply because their land and other properties are usually mortgaged with banks as security for the loans advanced to them for the normal working expenses of the plantations.

19. To make it easier for planters to avail of the loans, some State Governments have relaxed the security conditions. A 'Pool Guarantee Fund' is also proposed to be set up with an additional ½ per cent interest charged on loans to the planters and the interest earned thereon from year to year. This Fund will serve as collateral security for the grant of loans and the losses, if any, in excess of the assets in the Fund will be shared equally by the Central Government, the State Government and the Commodity Board concerned.

Middle Income Group Housing

20. A scheme for providing loans to middle income groups was introduced in February, 1959, with funds provided by the Life Insurance Corporation and is meant for persons whose income is between Rs. 6000 to Rs. 12,000 per annum. Loans to the extent of 80 per cent of the cost of the house subject to a maximum of Rs. 16,000 (Rs. 20,000 in the case of those who do not already possess a plot of land) are provided under the scheme. The loans are advanced to individual borrowers through the State Governments at the rate of 5½ per cent per annum. By the end of the Second Plan a sum of Rs. 10·5 crores was disbursed to State

workers have considerable urgency. Similarly, the housing of sweepers and scavengers must receive special attention. In selecting slum areas for clearance and improvement high priority should be given to areas predominantly inhabited by sweepers and scavengers.

URBAN PLANNING AND LAND POLICY

26. Urbanisation is an important aspect of the process of economic and social development and is closely connected with many other problems such as migration from villages to towns, levels of living in rural and urban areas, relative costs of providing economic and social services in towns of varying size, provision of housing for different sections of the population, provision of facilities like water supply, sanitation, transport and power, pattern of economic development, location and dispersal of industries, civic administration, fiscal policies, and the planning of land use. These aspects are of special importance in urban areas which are developing rapidly. The number of cities with a population of 100,000 or more has increased from 75 in 1951 to 115 in 1961, and their population now forms about 43 per cent of the total urban population. Of the aspects mentioned above, in the long run, the most decisive are the pattern of economic development and the general approach to industrial location. The broad objective must be to secure balanced development between large, medium-sized and small industries, and between rural and urban areas. While this is by no means easy to realise, the main ingredients of developmental policy are the following:

(i) As far as possible, new industries should be established away from large and congested cities.

(ii) In the planning of large industries, the concept of region should be adopted. In each case, planning should extend beyond the immediate environs to a larger area for whose development the new industry would serve as a major focal point.

(iii) In community development projects or other areas within a district, the rural and urban components of development should be knit into a composite plan based in each case on schemes for strengthening economic inter-dependence between towns and the surrounding rural areas.

(iv) Within each rural area the effort should be to secure a diversified occupational pattern in place of the present extreme dependence on agriculture.

In considering the nature of the urban problem to be phased over the next decade, it is necessary both to deal with the situation which exists now and to ensure action along the right lines for the future.

areas and for scaling down the rate of compensation. Similar legislation is also needed elsewhere. The scheme was reviewed by the Advisory Committee on Slum Clearance and by a Study Team set up by the Committee on Plan Projects. These Committees recommended that while long-term plans were required, it was even more essential to think of short-term measures to relieve acute distress in the slum areas and, as an immediate measure, minimum amenities like sanitary latrines, proper drainage, uncontaminated water supply, moderately good approach roads, paved streets, and proper lighting should be provided. Following consideration of the reports of these two committees the scope of the slum clearance programme was extended to include slum improvement. Larger resources were also provided as a matter of immediate priority for dealing with slum problems in six major cities, namely, Calcutta, Bombay, Madras, Delhi, Kanpur and Ahmedabad. In these cities, the total subsidy for slum clearance was raised from 50 per cent to 62½ per cent and the Central Government's share in it from 25 per cent to 37½ per cent.

24. The maximum effort under this scheme should continue to be concentrated on the six cities mentioned above. However, it is proposed that in the Third Plan, in principle, slum clearance and improvement work could be taken up wherever State Governments consider that the slum problem exists in acute form. In view of limitations of resources, it is considered that ordinarily towns and cities with a population of 100,000 or more should receive priority. It is suggested that State Governments may arrange for surveys of slum areas, classifying them in two categories—areas which may have to be cleared and re-developed completely, and those which can be made habitable through the improvement of environmental conditions. If the owners of slum properties falling within the second category fail to carry out the improvements, these should be carried out through local bodies and the cost recovered from the owners; where necessary, the properties could be acquired or requisitioned. Wherever improvements are carried out by local bodies in slum areas on public lands or requisitioned lands, it may be necessary to give them grants for providing essential services. The cooperation of voluntary organisations and social workers should be fully enlisted in carrying out the programme of slum clearance and improvement.

25. While steps are being taken to clear or improve the existing slums, it is equally important that new slums should not be allowed to grow up. This is by no means an easy object to achieve. Besides preparing and strictly implementing master plans for all growing towns and cities, it will be essential to enforce municipal bye-laws and building regulations, and at the same time, to expand housing facilities for low income groups and for economically weaker sections. As transitional measures, night shelters and dormitory accommodation for pavement dwellers and non-family

29. Specific measures for checking rise in land values can become effective if there is strict regulation of the uses of land, especially in and around metropolitan cities, large and growing cities and new industrial towns. It is for such towns that the preparation of master plans referred to later is of special importance. The following are the principal steps to be taken for controlling land values:

(1) Issue of notifications for freezing land values with a view to early acquisition of land by public authorities.

(2) Acquisition and development of land by public authorities in accordance with the interim general plans is essential for preventing speculation. The land should be acquired in bulk, although, depending upon local circumstances, the programme of acquisition would have to be suitably phased. Acquisition proceedings should be speedy and legal procedures should be simplified as far as possible. It is important that development of the acquired lands should be expedited. The essential services have to be provided by public authorities. Besides development undertaken directly by them, under appropriate regulations, cooperative and private agencies should also be utilised.

(3) Allotment of land on a lease-hold basis. As a rule, lands acquired by public authorities should be given out only on a lease-hold basis so that, besides the recurring income secured on account of the ground rent, a fair share in the increase in the value of land continues to accrue to the community.

(4) Betterment levies and taxation of agricultural lands put to non-agricultural uses. These are growing sources of revenue for States and local bodies, but in several States the existing provisions are inadequate.

(5) Capital tax on transfer of free-hold lands.

(6) Taxation of vacant plots in developed areas with power to acquire if they are not built upon within specified periods.

(7) Setting a ceiling on the size of individual plots and limiting the number of plots which a single party may be permitted to acquire.

(8) Determination of appropriate norms of rent and regulation and control over rents.

27. *Costs of urban development.*—Much of the deterioration which occurs in living conditions in rapidly growing urban areas is due to the high costs of urban development, in particular, the costs of providing housing, water supply, drainage, transport and other services. The situation is further accentuated by the existence of unemployment, overcrowding and the growth of slums and the fact that a significant proportion of the population in many cities is without shelter. The problems to be faced are formidable in size and complexity, and solutions for them can be found only if their nature is fully appreciated not only by the State Governments, but also by municipal administrations and by the public generally and if an increasing amount of community effort and citizenship participation can be called forth within each urban area. There are certain minimum directions in which action should be taken during the Third Plan so that, for the future, at any rate, a correct course is set. These are:

(i) control of urban land values through public acquisition of land and appropriate fiscal policies;

(ii) physical planning of the use of land and the preparation of master plans;

(iii) defining tolerable minimum standards for housing and other services to be provided for towns according to their requirements and also prescribing maximum standards to the extent necessary; and

(iv) strengthening of municipal administrations for undertaking new development responsibilities.

28. *Control of urban land values.*—The most important element in raising housing and other costs and in restricting the scale on which improvements can be undertaken in the interests of low income groups is high land prices. Apart from normal increases, a major factor in raising land prices is speculation. In some towns, there are powerful factors like the setting up of new industries and the establishment of new public and other offices which stimulate speculative activity. However, since the rapid economic development of the country as a whole is under way and exerts its influence in all directions, elements of rising land values are present in larger or smaller degree in almost every urban area. In several urban areas, there is need for drastic measures, legislative and others, for freezing land values and also for undertaking large scale public acquisition of land. According to the nature of the situation the need for adequate measures for taxation of urban land and property exists, without exception, in all towns.

32. *Standards.*—For the solution of the housing problem for the bulk of the population and for the elimination of slums and other evils, it is essential that certain minimum standards of residential and office accommodation and other services are set, keeping in view the requirements of the community as a whole and the limited resources available. It is also desirable that maximum standards should be prescribed. This will go some distance in making the investment on housing yield more socially desirable results. Luxury housing and waste of urban land should be prevented so that larger numbers of modest dwelling units can be constructed for the same investment. For achieving this objective, the principal methods are (a) adoption of fiscal measures including local taxation, aiming at discouraging diversion of funds for luxury housing, (b) advice on building designs, (c) modifications in existing building bye-laws of local bodies so as to facilitate construction of low cost housing in accordance with austere standards and specifications, (d) prefabrication of building components, and (e) greater use of locally available cheaper materials. The systematic study of standards and advice relating to them constitute important aspects of the work of the National Buildings Organisation.

33. *Strengthening municipal administrations.*—At the local level, municipal administrations alone can undertake satisfactorily the task of providing the services needed for development in urban areas, expansion of housing and improvement of living conditions. Most municipal administrations are not strong enough to carry out these functions. They should be sufficiently strengthened by increasing their resources and personnel and by enlarging their jurisdiction and functions. Where the present limits of the selected urban areas are insufficient to cope with the problem, they should be extended. In the case of growing towns, it would be desirable from the beginning to provide for larger rather than smaller municipal areas, so that these towns and the rural areas surrounding them can be developed together in a coordinated manner without having to face difficulties later on account of separate jurisdictions. Inevitably, municipal administrations have larger functions than in the past for providing civic services. It is envisaged that a large proportion of towns will in future have separate development plans of their own and these will be integrated with the plans of States. In this context, a careful review of the administrative and financial measures which should be taken in cities with a population of one lakh or more other than the metropolitan areas should be undertaken in each State.

RURAL HOUSING AND PLANNING

34. Improvement in housing conditions in the villages has a manifold significance. It raises the level of living, provides greater opportunities for work and is a vital element in the transformation of rural life. Yet,

These measures lie at the base of proposals for planned urbanisation and have therefore to be given concrete shape as a matter of high priority.

30. *Preparation of master plans.*—To secure orderly development of towns and cities, town planning is indispensable. The first step in this direction will be the preparation of interim general plans establishing the broad pattern of land use to which developments should conform. This should be followed by the preparation of detailed master plans for urban and regional development. Master plans should be drawn up in the first instance for metropolitan cities, State capitals, port towns, new industrial centres and other large and growing cities where, in the ordinary course, conditions are likely to deteriorate further. A tentative list* of such towns and cities has been drawn up for the Third Plan period. In redeveloping existing cities and building up new towns, it is of the utmost importance that the regional approach should be followed. This is necessary both for securing a proper balance between social and economic development and for achieving greater cultural unity and social integration in the life of developing urban communities. Greater attention to the environment and appreciation of the day to day needs of the people can go a long way to give to all citizens a sense of community in urban life.

31. The primary responsibility for the preparation of master plans lies with State Governments and the local administrations concerned. For the Third Plan, limited provision has been made at the Centre for assisting the State Governments in the preparation of master plans for these cities and towns. An essential preliminary is the enactment of suitable legislation on town and country planning. It is also necessary that State Governments establish Town Planning Organisations with adequate trained personnel. The Central Regional and Urban Planning Organisation can assist State Governments and organisations concerned with the establishment of new towns, in the preparation of master plans and in formulating suitable urban and regional development policies.

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* (a) metropolitan cities, State capitals and port towns

Ahmedabad, Bangalore, Bhopal, Cochin, Delhi (Metropolitan region), Greater Bombay, Greater Calcutta, Hyderabad-Secunderabad, Jaipur, Kandla, Kanpur, Lucknow, Madras, Patna, Poona, Shillong, Srinagar, Varanasi, Visakhapatnam and Trivandrum.

(b) industrial centres

Allahabad, Asansol, Barauni, Bhadravati, Bhilai, Bokaro, Chittaranjan, Coimbatore, Dehri-on-Sone, Dhanbad, Digboi, Durgapur, Gauhati, Gorakhpur-Deoria, Guntur, Jamshedpur, Kothagudam, Mirzapur, Moghul sarai, Nangal, Panvel, Ranchi, Rishikesh-Hardwar, Rourkela, Sindri, Tinsukhia, Vijayawada and Warangal.

(c) resource regions

Bhakra-Nangal area, Damodar Valley, Dandakaranya, Rajasthan Canal area and Rihand area.

scheme. The latter aspect is important because it is only when a small group of villages is taken up together that it is possible to arrange to set up a brick kiln or arrange for the supply of components on a cooperative basis to meet a continuing demand. The full impact of a housing programme in the rural area by way of increase in employment and improvement in environmental conditions cannot be obtained unless the programme is undertaken systematically in groups of adjoining villages. Layout plans are at present prepared generally for selected villages. They provide for the extension of the village site, improved village streets and drainage and land for such common amenities as the village school, the playground for school children and the panchayat bhavan. However, not enough is being done in these directions, and the available funds tend to be devoted mainly to the construction and improvement of a small number of houses. It is suggested that the first claim on the resources provided for the village housing scheme should be on account of the extension of the village site, improvement of roads and drainage and allotment of land for essential purposes of interest to the community as a whole. The key to improved housing is the availability of land for the extension of village site. To the greatest extent possible, the community itself, through mutual arrangement, should be expected to provide the additional land required. However, for assisting the community to acquire land for providing house sites for agricultural workers and Harijans it may be useful, as suggested later, to provide for a limited measure of assistance. The first place in the programme for improving village housing should be given to housing for Harijans, agricultural workers and those sections of the community whose housing conditions are specially deplorable. For scheduled tribes and scheduled castes in particular, besides funds available under the village housing scheme, assistance by way of subsidy is also given under the programme for the welfare of backward classes. Provisions under the two programmes should be utilised in a coordinated manner.

38. Rural housing cells, which have been set up in the States, and research-cum-training centres are already engaged in designing houses suited to different parts of the country, and involving the use of local materials. Work in these directions has to be intensified. There is frequently a temptation to resort to houses on urban patterns constructed in brick and cement without sufficient emphasis being placed on the use of local materials, economy of construction cost, cultural traditions and background of the locality and functional requirements of rural life. There is also inadequate stress on community effort in improving roads and drainage, contribution by way of land for the extension of the village site and mutual aid in constructing improved housing. The scale of the rural housing problem is so vast that provision of additional funds by itself, necessary as this may be, can produce only a small impact.

because of the magnitude of the problem and its inherent difficulties the task of improving housing conditions in the villages has to be viewed, not as an isolated objective, but as a part of the larger scheme of rural development. Consequently, rural housing is intrinsically a part of community development and village planning. The specific programme for rural housing as such is intended to supplement the resources of the community development movement at the level of the block and the village by way of assistance in the form of technical advice, demonstration, provision of improved designs and lay-outs, better use of local materials and, to a limited extent, provision of finance. Its essential object is to help create healthy environmental conditions for all sections of the village population and for balanced development of rural life as a whole. It is against this background that the village housing scheme which was introduced in 1957 has to be considered and its working reviewed.

35. The village housing scheme provides for the selection of villages in groups of four to six and the preparation of lay-out plans for these villages after carrying out physical and socio-economic surveys. The implementation of lay-out plans and rebuilding of houses is taken up in stages so that the entire village is remodelled over a period of 8-10 years. Co-operatives for the manufacture of different building components are organised. Assistance in the shape of loans upto 66 $^2/_3$ per cent of the cost of construction subject to a maximum of Rs. 2000 per house is given for building of houses. Loans are also given for carrying out improvements in existing houses in accordance with the standards prescribed by the State Governments. Provision has also been made in the scheme for acquisition of land required for streets, community buildings, new house sites and for thinning out densities etc. Research-cum-training centres have been established at six centres for promoting research in improving local building materials and construction techniques and for training personnel required for executing the scheme. The rural housing cells set up in the States for preparing lay-out plans and model designs etc. have been further strengthened.

36. During the Second Five Year Plan about 3700 villages were selected and socio-economic and physical surveys of about 2000 villages were completed. Lay-out plans of 1600 villages were drawn up and loans amounting to Rs. 3·6 crores were sanctioned for construction of about 15,400 houses. About 3000 houses were completed and the remaining houses were under different stages of construction.

37. In the working of the village housing scheme during the Second Plan it has been observed that as a rule the scheme has been taken up in isolated villages and not in groups of villages as was envisaged in the

to facilitating the total effort that is called for, it may be necessary to give a limited amount of assistance by way of grant to the village panchayat for undertaking the improvement of village streets and drainage as an essential step in the programme for replanning the village as a whole.

41. *House sites for agricultural workers.*—In the land reform legislation enacted in some States provision has been made for conferring rights of occupancy or ownership on tenants of village house sites. In a few States there are provisions for transferring ownership on payment of compensation. It is essential that priority should be given to the provision of land for families of landless agricultural workers. Wastelands and bhoodan lands should be used for this purpose to the extent possible. In some congested villages, while emphasising the obligations of the village community, it may be necessary to supplement its contribution in providing the land needed for extension of the village site, through acquisition of additional land for house sites for agricultural labourers. It is proposed to earmark Rs. 5 crores by way of grant under the village housing scheme for assisting States in securing house sites for landless agricultural workers in villages in which they form a fairly large part of the population and a comprehensive housing programme is taken in hand.

Housing Statistics

42. The present position of housing statistics is unsatisfactory in relation to the needs of planning. Except for data regarding the total number of houses and house-holds in the country thrown up by the decennial census there are no proper statistics on such aspects as current building activity, additions to houses made each year, quantity and cost of materials used, production and consumption of building materials and prices of building materials. Certain basic items of information on housing conditions have been collected in the population census 1961. These will facilitate compilation of an inventory of housing in the country and throw useful light on structural, functional, size and tenure characteristics.

43. The National Buildings Organisation is arranging for the collection of housing statistics in the public sector through various construction agencies such as the Central and State Public Works Departments and others. In other fields, the actual collection of statistics has to be undertaken by the appropriate agencies, while questions of method and approach have to be considered by the National Buildings Organisation and the Central Statistical Organisation. In view of the unsatis-

In the main the problem is one of creating a widespread desire for better living, evolving practical methods for improving the village environment and building better houses at relatively small cost based mainly on co-operative self-help, community effort and contribution and the use of local building materials.

39. In the Third Plan it will be essential to link up the programme more closely with different schemes of community development such as provision of water supply, roads, drainage, public health, education etc. It is also necessary that rural housing activities should be effectively co-ordinated with other connected programmes of rural development so as to ensure that the villages selected under the village housing scheme derive the maximum benefit from the limited resources which are available. For example, the subsidy admissible under the programme for ameliorating the living conditions of scheduled castes and scheduled tribes should be made available to members of these communities residing in the villages selected under the scheme. Village and small industries should also be set up to the extent possible in the selected villages. Special attention has to be given to the setting up of brick-kilns and local production of building components, such as doors, windows, etc. For this purpose, cooperatives should be organised, and they should be given technical assistance and materials such as wood and coal-dust.

40. A number of new villages are coming up on account of reclamation of large tracts of land and development of new areas for agriculture. It should be ensured that the layout plans of such villages are prepared in advance and they develop in a planned way. In the case of existing villages where the problem is, in part, one of redevelopment, the success of the programme will depend upon their proper selection. The scheme already lays down that amongst other considerations preference will be given to (a) villages which are situated in flood-affected areas, (b) villages which have substantial populations of backward classes and agricultural labourers, (c) villages in which consolidation of holdings has been completed or in which programmes for increasing agricultural production are being successfully implemented, and (d) villages whose inhabitants happen to be displaced because of major development projects or natural calamities. Villages which have concentrations of artisans should also be given preference. Evidence of cooperative self-help and willingness on the part of the village community to contribute land for the extension of the village site and to give priority to the housing of Harijans and other backward classes should be important considerations in the selection of villages suitable for a programme of village housing. In selected villages in which these conditions are fulfilled, with a view

gypsum for light weight partitions, masonry mortars, hollow bricks and tiles, utilisation of waste products like blast furnace slag for the production of light weight aggregates and the influence of climatic and regional factors in relation to designs of houses and other aspects. Research in housing and construction is essential for reducing building costs and improving the quality of construction, and programmes now in hand should be further intensified. The training of different types of construction workers is an important factor in securing these objectives and has to be organised much more extensively and systematically than in the past. The work of research-cum-training centres for rural housing has far-reaching interest, and the results achieved in evolving new designs of rural houses and fuller use of local building materials should be carried into the field through education and practical demonstration.

46. With the growth of population in towns and cities and the progress of the economy, problems of housing and urban and regional development will come to occupy an increasingly critical place in the successive Five Year Plans. The right solutions to these problems are of great consequence both for social stability and for general welfare. In varying degree, these problems are faced both by advanced and by less-developed countries, and over the years a considerable body of knowledge and experience has been built up by the United Nations and other international agencies as well as by research centres and institutions abroad. The National Buildings Organisation, which already serves as a Regional Housing Centre for research and study of the problems of hot and arid zones in the ECAFE region can make the results of studies and experiments undertaken by other countries and international organisations available to construction agencies and organisations in different parts of India.

factory state of statistics regarding building and construction, in November, 1960, the Central Council of Local Self-Government proposed that local bodies should modify their bye-laws so as to make it incumbent on applicants, both at the time of applying for building permits and for issue of completion certificates, to provide detailed information about investment and other aspects. In February 1961, the Central Statistical Organisation requested State Statistical Bureaus to initiate the collection of information from corporations and municipalities on a uniform pattern. The forms suggested by the Central Statistical Organisation provide for a common classification of buildings and seek information regarding the nature and type of construction, area, estimated cost, number of dwelling units in the case of residential construction, and materials used for walls, roof and floor. As the subject is one of considerable complexity and large numbers of cities and towns are involved, it would be desirable first to establish an adequate system of building statistics in a small number of cities and towns and to phase the programme for extending it to other centres. To be useful, it is important that the returns should flow at regular intervals and in the ordinary course of administration of building rules and bye-laws.

44. Statistics of production and consumption of building materials are also needed from time to time to survey the supply and demand position of materials of building construction. While figures of production are already available in the case of organised industries such as steel, cement, etc., no reliable estimates of materials such as bricks, lime etc. produced in the un-organised sector are available. These may be collected through periodic sample surveys. Statistics of consumption and requirements of building materials could, however, be developed through the use of technological ratios related to value of construction on the basis of certain type studies. Some type studies have already been carried out in the country and there is need to increase their scope and coverage. Prices of selected building materials and wage rates at selected centres in the country should also be collected regularly and published by the National Buildings Organisation and State Statistical Bureaus.

RESEARCH AND TRAINING

45. A considerable volume of research in the field of housing and construction has been undertaken in recent years at the Central Building Research Institute and at other centres. Since its establishment in 1954, the National Buildings Organisation has also sponsored a series of research projects and endeavoured to make the results of research more widely available. Thus, investigations have been carried out regarding techniques and materials for water proof renderings for mud walls, effect of wall thickness and ceiling heights on thermal insulation, utilisation of low-grade

of scheduled tribes was estimated at 22·5 million and that of scheduled castes at 55 million. The population of 'denotified' tribes (formerly described as 'criminal' tribes) was reckoned at about 4 million. In different States, according to the local conditions, certain other groups are also described as 'other backward classes' and special steps are taken to safeguard their interests.

Development programmes for the welfare of backward classes, for which provision is made in the Five Year Plans, are intended to supplement benefits accruing from programmes of development in different fields such as agriculture, cooperation, irrigation, small industries, communications, education, health, housing, rural water supply and others. One of the principal lessons of the past decade is that for a variety of reasons, in the ordinary course, the weaker sections of the population are not able to secure their fair share of the benefits of provisions made under different heads. To enable them to do so, it is desirable that the normal patterns of assistance should provide, wherever necessary, for an element of special consideration for the weaker sections and, in particular, for the backward classes. It is observed that in a number of schemes formulated in favour of backward classes, the financial resources provided for this section of the population are proposed to be utilised in part to meet the cost of additional subsidy or other assistance to enable the backward classes to avail themselves of the general development programmes. This has the effect of reducing the scope of additional development to be undertaken from the special provisions made for the backward classes. The problem needs further consideration, since, on the one hand, it is essential that the general development programmes should be so designed as to cater adequately for the backward classes and, on the other, the special provisions in the Plan should be used as far as possible for securing additional and more intensified development.

3. For programmes relating to the welfare of backward classes, a total outlay of Rs. 79 crores was incurred in the Second Plan compared to Rs. 30 crores in the First Plan. The Third Plan at present provides for programmes estimated to cost about Rs. 114 crores. The distribution of these outlays among different sections is shown below:

(Rs. crores)

	First Plan outlay	Second Plan estimated expenditure	Third Plan estimated cost of programmes
scheduled tribes	19·83	43·00	60·43
scheduled castes	7·08	27·66	40·40
denotified tribes	1·10	2·89	4·00
other backward classes	2·03	5·86	9·04
total	30·04	79·41	113·87

CHAPTER XXXIV

DEVELOPMENT OF BACKWARD CLASSES

I

GENERAL CONSIDERATIONS

PROGRAMMES for bringing scheduled tribes, scheduled castes and other backward classes to the level of the rest of the community are among the most significant undertaken during the First and Second Plans. Success in fulfilling them is difficult to measure. It involves far-reaching changes in social organisation and in social practices and is a test equally of the progress achieved in improving the conditions of the sections of the community directly affected and in reconstructing the structure of the Indian society itself, specially in rural areas. Article 46 of the Constitution laid down the Directive Principle that the State shall promote with special care the educational and economic interests of the weaker sections of the people and, in particular, of scheduled castes and scheduled tribes, and shall protect them from social injustice and all forms of exploitation. The Constitution also provided for certain reservations for scheduled tribes and scheduled castes. These were limited, in the first instance, to a period of ten years but by a recent amendment of the Constitution, these reservations have been extended by a further period of ten years. Since such safeguards are a reflection of the economic and social conditions of the groups concerned, Parliament's action has a twofold significance. Firstly, the problem of raising the living standards of scheduled tribes, scheduled castes and other weaker sections of the population is much more complex than had been earlier realised and calls for sustained endeavour over a long period. Secondly, besides ensuring rapid and sustained growth for the economy as a whole, at least during the next two or three Plans, measures for advancing the economic and social interests of scheduled tribes, scheduled castes and other weaker sections of the community should be so intensified, that they do, in fact, reach a level of well-being comparable with that of other sections of the population. Development programmes included in the plans of States and the Centre for the Third Five Year Plan will need to be continually re-assessed from this angle and steps taken to increase their total impact in various directions as the Plan proceeds. This is a crucial task in the attempt to evolve an integrated society and a well-knit economy for the country as a whole.

2. The lists of scheduled castes and scheduled tribes were revised in 1956. On this basis, according to the census of 1951, the total population

developments, the tribal people should be enabled to develop along the lines of their own genius, with genuine respect and support for their own traditional arts and culture and without pressure or imposition from outside. In tribal areas every effort should be made to train and build up a team of their own people to do the work of administration and development. Some technical personnel from outside would no doubt be needed, specially in the beginning, but the aim should be constantly to develop local personnel both as official functionaries and as social workers. In determining the development schemes to be implemented, as experience during recent years bears out, it is desirable to avoid taking up too many small and isolated schemes which cannot have much impact; instead the stress should be on a few programmes of basic importance which are calculated to mitigate poverty, impart new skills, promote health and better living, improve communications without upsetting the stability of social and cultural values, the pattern of leadership and institutions and the scheme of obligations within the tribal community.

7. Execution of development programmes meets with several practical difficulties and limitations. For instance, in the absence of adequate local personnel or effective means of communication between personnel engaged in development work and the traditional leadership and institutions, it may not always be easy to observe the various tribal policies outlined above. Nevertheless, these policies provide general guidance in formulating and carrying out development programmes. It was in view of the special character of the problems involved that Article 339 of the Constitution provided for the setting up of a Commission within ten years of the commencement of the Constitution to report on the administration of scheduled areas and the welfare of the scheduled tribes in the States. The Scheduled Areas and Scheduled Tribes Commission, which was set up in April, 1960, has recently submitted an interim report based on its study of developments in nine States (Andhra Pradesh, Assam, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Orissa, Punjab and Rajasthan) and one Union Territory (Himachal Pradesh). In this report the Commission has drawn urgent attention, amongst others, to the following important aspects:

(1) In most States the special protective machinery for safeguarding the interests of the tribal people and protecting them from exploitation by outsiders has not worked satisfactorily. There have been large-scale transfers of tribal land consequent upon the undesirable activities of money-lenders, forest contractors and other exploiters. The reorganisation of forests and enunciation of new policies have resulted in the curtailment of their rights in forests and in fishing and hunting. In Bihar, Madhya Pradesh and Orissa industrial and other development schemes have

In respect of scheduled tribes, besides the provisions in the plans of States which are intended to benefit them in particular, developmental outlays of territories like NEFA, Nagaland, Manipur and Tripura, are reckoned in the Third Plan at over Rs. 40 crores compared to over Rs. 20 crores in the Second Plan.

4. Of the outlay of Rs. 114 crores in the Third Plan, provided for the welfare of backward classes, about Rs. 42 crores are intended for schemes of educational development, Rs. 47 crores for economic uplift schemes and Rs. 25 crores for health, housing and other schemes. The problems of scheduled castes and other backward classes are essentially those of economically weaker sections of the community, who suffer also in larger or smaller measure from social disabilities. Denotified tribes constitute a special group whose assimilation into the larger community presents peculiar difficulties, but is nonetheless a matter of great urgency. In the context of a rapidly developing economy, scheduled tribes can no longer remain in the isolation which characterised them in the past and in many areas, with the onset of industrialisation and large irrigation and power projects, they confront the most complex problems of adjustment and rehabilitation. Although there are certain common considerations and approaches, scheduled tribes living in different parts of the country vary a great deal among themselves, and the special conditions and problems of different tribal groups have always to be kept in view.

II

Scheduled Tribes

5. The broad policies to be followed for the development of tribal populations and tribal areas have been reviewed recently by the Study Team on Social Welfare and Welfare of Backward Classes set up by the Committee on Plan Projects, the Committee on Special Multi-purpose Tribal Blocks and the Central Advisory Board for Tribal Welfare and also in special studies in respect of such tribal areas as NEFA and Nagaland. There is a broad consensus of opinion that while the rest of the population of the country goes forward, and India and the world change so rapidly, the tribal areas can scarcely remain in isolation. At the same time, it would be an error to over-administer these areas in the name of development and, in particular, to send too many officials and others to work amongst the tribal people. A middle way between these extreme positions has to be found.

6. Development in such directions as education and provision of training facilities, improvement of agriculture, building up of communications, improvement of health and medical facilities and supply of drinking water are both essential and inevitable. In facilitating these

cooperatives and forest labourers' cooperatives, and improvement of communications. In the educational programme; stress has been laid on concessions in the form of stipends, freeships and other grants, scholarships before and after matriculation, establishment of new schools, including ashram schools and training in agricultural and industrial crafts. Schemes for supply of drinking water. for improvement of housing conditions and for setting up of dispensaries, maternity and child welfare centres and mobile health units have also been undertaken.

9. In the light of the experience gained in the Second Plan, the general lines on which programmes should be drawn up for the Third Plan were considered by a special working group. It is proposed that economic uplift programmes should give priority to the economic rehabilitation of persons engaged in shifting cultivation, working of forests through cooperatives composed of members of scheduled tribes, and formation of multi-purpose cooperatives for meeting the credit requirements of tribal agriculturists and artisans and for marketing their products. From the provisions made under different heads, programmes should be undertaken in tribal areas for land improvement. land reclamation and soil conservation, minor irrigation, supply of improved seeds, manures, implements and bullocks, provision of facilities for training. demonstration of improved practices, development of cattle, fisheries. poultry, piggeries and sheep-breeding, organisation of training-cum-production centres and provision of assistance and advice to village artisans engaged in cottage industries. In the programme for education, apart from primary schools to be provided for under the general scheme, there should be assistance at the middle and secondary stages for freeships and stipends and hostels. Scholarships and freeships should also be provided for technical training. The main highways should be undertaken as part of the general development programme and resources provided for scheduled tribes should be used, in particular, for culverts, causeways and bridges needed for connecting inaccessible areas, approach roads, jeepable forest roads and repairs to existing communications with remote and inaccessible areas. In the medical and public health programme, the working group has suggested priority for preventive measures for diseases common in each area, provision of itinerant medical units, establishment of maternity and child welfare centres and provision of drinking water in difficult areas.

10. The plans of States have been generally drawn up in accordance with the suggestions outlined above. They will, however, need to be reviewed from two aspects, namely, (a) greater intensification in the light of the recommendations which may be made by the Scheduled Areas and Scheduled Tribes Commission. and (b) ensuring that the special provisions are utilised as far as possible for additional programmes rather

led to large-scale displacement of the tribal people. There is need, therefore, for strengthening and in some cases for reorganising the administrative set up for the scheduled areas.

(2) The requirements of personnel for working in tribal areas, specially Tribal Welfare Officers, technical specialists and field level workers have not been adequately assessed. This factor is responsible for a setback in the implementation of welfare schemes. Recruitment of personnel without a long-term view of requirements has proved unsatisfactory. There has been a chronic shortage of trained workers in the scheduled areas. Personnel who are to work in tribal areas must be oriented to the tribal way of life and appreciation of the special disabilities from which the tribal people suffer. Development activities more or less conceived on the lines of non-tribal areas have generally failed to make adequate headway and impact on the tribal areas. There is need, therefore, for a larger effort through special institutions and otherwise for giving orientation training to personnel at various levels working in tribal areas. Difficulties such as the grant of requisite allowances for personnel who have to work under difficult conditions have also to be resolved satisfactorily.

(3) There are a large number of problems emerging in tribal areas which call for scientific study and evaluation, for instance, the impact of industrialisation in tribal areas, the rate of dispossession of land, prevalence of various systems of debt bondage, and social and economic effects on the tribal people of specific development schemes and of institutions like ashram schools, forest labourers' cooperative societies, grain golas, etc.

(4) Non-official voluntary organisations have a significant role in the development of tribal areas. They should be adequately assisted on the basis of programmes which are carefully formulated and coordinated with other activities.

The existing arrangements have to be considered further in the light of the Commission's recommendations and steps taken to improve upon them where necessary.

Programmes for the Third Plan

8. During the Second Plan a variety of development schemes have been undertaken in tribal areas. Thus, the economic uplift programme has included schemes for land settlement, land reclamation, distribution of seed and setting up of demonstration farms, establishment of service

development schemes in the same category are those relating to cooperation, including forest cooperatives, and marketing-cum-consumer cooperatives, award of post-matriculation scholarships, Tribal Research Institutes and training, research and surveys.

13. As pointed out earlier, the programme for scheduled tribes will be reviewed after the final proposals of the Scheduled Areas and Scheduled Tribes Commission become available. In this connection, it may be stated that in its interim report, referring to nine States and one Union Territory, the Commission has recommended a total outlay of about Rs. 73 crores as against the provision in the Plan as at present formulated (including both State Plans and Centrally sponsored schemes) of about Rs. 54 crores. The following table compares the present provisions in the Plan for all States and Union Territories and those for areas considered in the interim report of the Commission:

(Rs. crores)

	all States & Union Territories	nine States & one Union Territory	
	provision in the Third Plan	provision in the Third Plan Centre and States	outlay recommended in the Interim Report of the Scheduled Areas & Scheduled Tribes Commission
education . . .	14·48	12·26	15·38
economic uplift . .	37·12	34·39	48·07
health, housing and other schemes . . .	9·55	6·99	9·45
total .	61·15	53·64	72·90

The Commission has also indicated the possibility of additional areas being declared as scheduled areas; for these, some supplementary resources may be required. The Commission's proposals regarding development programmes, which will be considered carefully, may call for some further resources. The precise additions needed in the provisions for scheduled tribes, the extent to which the further outlays proposed under different heads can be met from the general allotments made for them in the Plan and the respective contributions of the Centre and of individual States will be considered in due course.

PROBLEMS OF DEVELOPMENT

14. As a result of work in the first two Plans and the reviews undertaken by expert committees and others, the general patterns of development in tribal areas are fairly well established. It is of course essential

than merely for altering the patterns of assistance made available to the backward classes under the general schemes of development. As a rule, such concessions as are considered necessary in the interest of these groups should be built into the schemes themselves and should not be dependent on resources being diverted from the limited provisions made specifically for the welfare of backward classes.

11. The Plan provides for a large programme of tribal development blocks, which aim at intensive and coordinated development in tribal areas on the general pattern of community development, but modified to suit tribal conditions and supplemented by additional resources. In all, 43 development blocks came under this programme during the Second Plan. Each Block involved a total outlay of Rs. 27 lakhs, Rs. 12 lakhs being found under Community Development and Rs. 15 lakhs by the Ministry of Home Affairs. The scheme has now been altered so as to provide for a total outlay of Rs. 22 lakhs in stage I (the contribution of the Ministry of Home Affairs being Rs. 10 lakhs), followed by a further period of five years under stage II for which an allotment of Rs. 10 lakhs will be made; Rs. 5 lakhs under Community Development and Rs. 5 lakhs from the Ministry of Home Affairs. Following the recommendations made by the Committee on Special Multi-purpose Tribal Blocks, the scheme of Development in these areas has been made much more flexible. The programme will now extend not only to scheduled areas but also to those blocks in which the tribal population constitutes two-thirds or more of the total population. In place of the schematic budget suggesting in detail the distribution of the available resources under different heads, it is now proposed that about 60 per cent of the funds should be allotted for economic uplift, 25 per cent for communications and 15 per cent for social services, with the suggestion that for tackling effectively the problem of drinking water supply further resources might be secured from the provision for economic uplift. The Third Plan provides in all for 300 tribal development blocks.

12. As a result of recent discussions there is already a consensus of opinion as to the basic conditions required for the successful execution of the programme for tribal development blocks. These are, in particular, careful planning, coordination of activities, training and orientation of personnel to the needs of the tribal communities, special attention to the requirements of the poorer and the more inaccessible areas, respect for tribal rights in land and forests and active association of the traditional tribal organisations and leadership with the implementation of development programmes. The programme for tribal development blocks is being implemented as a Centrally sponsored scheme. Other

the problem of past indebtedness should be dealt with in a more basic way than in the past. Some action has been recently taken in the States. For instance, in Andhra Pradesh interest outstanding in January 1957 in favour of any creditor is discharged and only the principal is payable. Interest rates are also regulated. Investigations into the extent of indebtedness among scheduled tribes have been undertaken in Maharashtra, Gujarat, Madhya Pradesh, Madras, Assam, Orissa and Himachal Pradesh and in the Lahaul and Spiti areas in the Punjab. The problem as a whole needs fresh consideration. The available data might be considered by a special committee with a view to evolving effective measures and policies. These must include, amongst others, provisions for liquidation and settlement of debts as well as regulation of the terms and conditions for new loans. For the future, the main reliance will necessarily have to be placed on rapid development of cooperative finance and marketing. In this connection the working of schemes like the Andhra Scheduled Tribes Cooperative Finance and Development Corporation should be studied closely with a view to determining further directions of cooperative development among scheduled tribes. It is important that cooperative organisations should be adapted to the actual requirements of scheduled tribes and the conditions prevailing in different areas and that rules and procedures should be greatly simplified. The Ministry of Home Affairs have recently constituted a working group to consider how scheduled tribes and other backward classes should be assisted to benefit fully from programmes of cooperative development during the Third Plan and to suggest suitable types of cooperative organisation and the changes needed in rules and bye-laws.

18. In tribal areas, as a rule, there is considerable under-employment. It is proposed that in the rural works programmes to be undertaken during the Third Plan, the requirements of employment in tribal areas during the long slack agricultural seasons should be specially kept in view.

19. In the plans of States, there are several schemes for the promotion of cottage industries in tribal areas. In the past, cottage industry programmes do not appear to have had a significant impact. This may be due, in part, to the difficulty of selecting the industries to be developed on economic lines, and in part to paucity of personnel and to lack of assurred marketing and credit facilities. As suggested by the Committee on Special Multi-purpose Tribal Blocks, it is essential to study closely the arts and crafts which already exist in each area and to consider how these could be developed and also the new crafts which could be introduced on an economically satisfactory basis. In this connection, a further problem may be mentioned. In the tribal areas there is a very large proportion of boys, roughly between the ages of 11 and 14 or 15 years, who have either not gone to school at all or whose education has been discontinued. If facili-

to strengthen the machinery for implementation. It is also necessary from time to time to assess the progress which is realised. Objective evaluation is of great importance because in a field as complex as the welfare of tribal populations, there is frequently a gap between the policies which are enunciated and the manner in which effect is given to them in the field. In the tribal areas, such a gap is not only undesirable in itself but may lead to frustration and may cause serious social and psychological disturbances.

15. In carrying out programmes of development during the Third Plan, there are certain aspects which need to be specially stressed. The principal economic problems of tribal populations centre on lack of continuous employment and the prevailing indebtedness. In a real sense these are interconnected problems. Tribal communities depend for their living almost entirely on agriculture and forests. The importance of safeguarding their rights in land and in forests has been stressed already. In some States, notably in Maharashtra and Gujarat, forests in scheduled areas are to a large extent worked through forest labourers' cooperatives composed of tribal people. These have on the whole proved satisfactory, but care has to be taken to see that the workers are not exploited either by subordinate officials of Forest Departments or by unscrupulous persons from amongst the tribal people themselves. Invariably, social workers and officials of Tribal Welfare Departments should be associated with the working of these cooperatives. In States in which exploitation of forest resources is still being undertaken mainly through contractors, the existing system should be replaced as early as possible.

16. To a large extent improvement in the economic conditions of scheduled tribes depends upon the success with which levels of agriculture are raised. From this aspect, wherever settled cultivation already exists, there should be the utmost stress on supply of improved seeds, fertilisers and credit, increase of irrigation, soil conservation and land reclamation, adoption of better implements and technical guidance. Where shifting cultivation prevails, the transition to settled agriculture is generally likely to be slow and long-drawn. In these areas, the primary aim should be to ensure that shifting cultivation is carried out on a scientific basis so as to limit its disadvantages and promote the fertility of the soil. The problems of changing over from shifting to settled cultivation are now better appreciated than in the past; nevertheless they need to be studied at first hand in each area jointly by agricultural and tribal experts and social workers associated with them before the communities concerned are advised to change the practices which they are accustomed to follow.

17. Among the tribal people there are many factors for favour of development along cooperative lines. However, for cooperation to succeed in raising levels of income and increasing production, it is essential that

without cadres of public servants and social workers having intimate knowledge, imbued with sympathy, and trained in carrying out the tasks allotted to them. Short-term assignments in tribal areas given to officials, who are liable to transfer elsewhere are far from satisfactory. To bring the scheduled tribes to the level of the rest of the population calls for sustained efforts for a generation or more on the part of thousands of devoted public servants and social workers, who should be drawn more and more from amongst the tribal people themselves. As a rule, although much has been accomplished during the first two Plans, departments in the States set up for carrying out development programmes among the tribal people are on the whole insufficiently equipped with personnel and do not always enjoy the requisite support for undertaking the extraordinarily difficult tasks falling to them. In these circumstances, having regard to the special responsibilities envisaged in the Constitution, it might be worth considering whether the Central and State Government should now cooperate in forming a special cadre comprising technical and other personnel for work in scheduled areas and in other areas which have concentration of tribal populations. Such a cadre could provide for personnel above the field level. As a rule, those belonging to the cadre could work within their own States but, at the higher levels of responsibility, they could also be available for work elsewhere. The most significant aspect, of course, is that a body of trained persons would spend their entire period of service among the tribal people, so that their knowledge, experience and sense of identification would become a vital factor in assuring rapid and uninterrupted development. Along with measures taken to strengthen the public service, it is also essential that as a matter of public policy strong voluntary organisations should be built up for work among the tribal people.

III

Scheduled Castes

22. As distinguished from scheduled tribes, scheduled castes are widely dispersed and, while they form part of the general community, the social disabilities from which they suffer and their economic weakness place them in a special category. The Constitution abolished 'untouchability and forbade its practice in any form, and the Untouchability (Offences) Act, 1955, made the offence of 'untouchability' cognisable and punishable uniformly throughout the country. While they have social problems which are peculiar to them, the economic problems of scheduled castes are in the main common with those of other weaker sections of the community. The Third Plan provides about Rs. 40 crores for special programmes relating to scheduled castes as compared with out-

ties for imparting vocational training of even a simple character could be developed in tribal areas, these boys could be equipped for productive work.

20. In recent years, several large projects for the development of irrigation, power and industry have been located in areas inhabited by tribal populations. As an immediate effect of these projects, there has been a considerable measure of dislocation and uprooting. The number of families required to be displaced on account of such projects has frequently run into thousands. Efforts are made to provide compensation in land or cash or both. It is important that the compensation should be sufficient for ensuring effective rehabilitation. As far as possible, compensation should take the form of land. The productive value of the land which is given up should be an important factor to be taken into account in determining the scale of allotment. It has been observed that compensation taken in cash is soon squandered, and frequently, where compensation has taken the form of land, for a variety of reasons, satisfactory resettlement has not been achieved. For a time unskilled work is available at the site of the project. When the construction phase of the project is completed and the need is for skilled workers, there is little scope for employing displaced tribal workers. In these circumstances, the damage done to the communities concerned as well as to the individuals is irreparable and becomes, in turn, a source of resentment. With rapid development during the Third and subsequent Plans, this problem is likely to grow in magnitude and should be handled with extreme care. In determining locations of projects, the possibility of avoiding eviction wholly or in part should be fully considered. When no alternative exists, it is suggested that instead of dealing with the problem of eviction and resettlement directly through their own officials or even through the normal revenue administrations, the agency of Tribal Welfare Departments and of voluntary organisations should be utilised. Responsible voluntary organisations, if taken into confidence at an early stage in the project and provided with the necessary resources, can be most helpful in the task of arranging the transfer of the population, resettlement and other rehabilitation measures. They should of course be given a measure of discretion and flexibility in dealing with the problems which arise. It has to be remembered that even though individuals have to be given compensation, in the context of tribal life, they do not and cannot stand alone, and it is no less important to sustain their sense of belonging to a larger community with its own way of life and codes of behaviour and organisation.

21. Tribal welfare programmes affect large numbers of people and the many new developments now under way may produce results which may change fundamentally the character of tribal life and institutions. The resulting problems cannot be dealt with satisfactorily

(3) provision of house sites for members of scheduled castes—

(a) who are engaged in unclean occupations, and

(b) who are landless labourers;

(4) award of post-matric scholarships; and

(5) aid to voluntary organisations.

Under the general housing programmes, funds are earmarked for acquisition and development of lands for granting house sites to agricultural workers amongst whom members of scheduled castes form a considerable proportion.

25. Since members of scheduled castes generally live in small groups intermixed with the rest of the population, their welfare and progress are bound up to a large extent with those of the community as a whole. Improvement in their living conditions and levels of income constitutes one of the major tests of economic and social progress in the country. Since 1947 legislation has been enacted for dealing with the social disabilities of the scheduled castes and, progressively, with the support of public opinion, arrangements for enforcing the laws are being strengthened. Such social disabilities as remain are in considerable degree due to economic backwardness. Economic development programmes have, therefore, special urgency. In the measure in which, as envisaged in the Third Plan, the benefits of various development programmes can be carried effectively to the weaker sections of the community, scheduled castes will gain from these programmes.

26. While assistance in education is given high priority in programmes for the welfare of backward classes and regulations for recruitment to the public services provide for reservation of posts, it is observed that frequently the prescribed proportions are not being reached. At the same time, in some areas, persons belonging to backward classes who have received some measure of education may be found among the unemployed. This is specially the case with persons whose education fits them only for clerical and like positions. It is, therefore, necessary to place much greater emphasis on technical and vocational training. As proposed in the Chapter on Education, it is also necessary that schemes for scholarships and other assistance in education should be so devised that promising students are effectively able to complete their studies and reach the stage at which they are eligible for permanent employment. It would be desirable to select young persons from amongst scheduled castes and from backward classes in general at an early enough stage and to help them continuously through the entire educational career, with assurance, wherever possible of employment at the end.

lays of about Rs. 28 crores in the Second Plan and nearly Rs. 7 crores in the First Plan. About Rs. 30 crores have been provided for scheduled castes in the plans of States. About one-half of this amount is for education schemes and the balance is divided almost equally between (a) schemes for economic uplift and (b) health, housing and other schemes. These provisions are intended to supplement benefits which should be available in an increasing measure to scheduled castes from the general development programmes provided for in the Plan, especially since the Plan places special emphasis on ensuring that the weaker sections of the community obtain their due share of the benefits in each programme. The community development programme, the rural works programme, schemes for land resettlement, the programme for village and small industries and other schemes undertaken in the interest of agricultural labourers have the greatest significance for raising the living standards of scheduled castes and other weaker sections of the community.

23. During the First two Plans, the major stress in carrying out development programmes for scheduled castes has been on education. Thus, as compared to 600,000 scholarships awarded to scheduled caste students in 1956-57, the number in receipt of scholarships at the end of the Second Plan is about 900,000. At the post-matriculation stage, the number of scholarship-holders from among the scheduled castes has risen from less than 1100 at the beginning of the First Plan to about 40,000 at the close of the Second Plan.

24. As explained already, programmes for scheduled castes included in the Third Plan are intended to provide for certain special schemes: they do not in any sense take the place of development programmes undertaken for the community as a whole. In the field of education, the main aims are to make available special scholarships based to the extent feasible. on suitable merit-cum-means tests, provision of residential facilities at educational institutions as a rule in mixed hostels, exemption from fees, and financial assistance for needy students. For promoting economic uplift, stress is laid on allotment of land and assistance for settling as cultivators, training in village and small industries introduction of improved techniques in the traditional crafts. While the bulk of the special allocations are made in the plans of States, the Ministry of Home Affairs provide for the following Centrally sponsored schemes:

(1) improvement of the working conditions of persons engaged in unclean occupations including eradication of the practice of carrying night soil as head loads;

(2) subsidies for housing for sweepers and scavengers;

organisations should be given a larger role. Long years of patient work will be needed among these tribes before their innate fears are laid at rest and confidence gained and the urge to build up a better social and economic life motivates a sufficient number among them to learn new crafts, become efficient cultivators and be integrated with the rest of the population.

29. In view of the small results achieved thus far in rehabilitating denotified tribes, it is considered that their needs should be studied in each area at close range and suitable programmes should be formulated, keeping in view the long-term and complex nature of the problems involved. The programmes could be drawn up broadly on the lines of the recommendations of the Study Team set up by the Committee on Plan Projects, especially the following:

(1) the need for a combined correctional and welfare approach for the rehabilitation of denotified communities, which should be supported by a programme of social education;

(2) formulation of special economic programmes which keep in view the character of the population, in particular, their adventurous spirit and traditional skills;

(3) organisation of industrial and other cooperatives;

(4) provision of opportunities for employment in the public services supported by way of additional training and orientation facilities; and

(5) wherever the denotified tribes constitute a sizable population, cadres of trained workers, who are familiar with their social and cultural background and can work closely with them should be built up.

30. If the problems of the denotified tribes are to be approached in the manner suggested above, special efforts will be needed for close study of the problems and attitudes of different sections among denotified tribes. Investigations among denotified tribes have been undertaken hitherto in an ad hoc manner, and in fact not enough is known about them and of the effects on them of current social and economic developments. In view of the numbers involved and the extremely difficult nature of the problems to be resolved, it is suggested that there should be systematic planning of the studies required and, for this purpose, the assistance of schools of social work and other institutions should be fully availed of. Official agencies concerned with the problems of denotified tribes should be strengthened, and both voluntary organisations and research workers should be closely associated with them. The objective of assimilation should guide the programme of rehabilitation and development from the very start and progressive and forward-looking elements among the denotified tribes themselves should be assisted and encouraged to play an increasing part in this effort.

27. Voluntary organisations are given assistance for educating the public regarding the removal of untouchability. Assistance for this purpose will be extended to them on a large scale in the Third Plan. It is important that voluntary organisations should go beyond work relating to publicity and propaganda and should actually establish or help to set up institutions such as schools, hospitals, housing cooperatives, industrial centres, etc., and should assist in running them. Such centres will provide an effective base for the work of voluntary organisations and will be of the greatest value in the economic rehabilitation of scheduled castes and other sections of the population.

Annual reports of the Commissioner for Scheduled Castes and Scheduled Tribes indicate the progress made in dealing with the problem of scheduled castes. A general evaluation was also attempted by the Study Team on Social Welfare constituted by the Committee on Plan Projects. Specific problems have been studied by special committees or groups as, for instance, the recent report of the committee appointed by the Central Advisory Boards on Harijan Welfare to consider conditions of scavengers. There is need for fuller and more frequent evaluation of the impact of development programmes on the conditions of scheduled castes, so that, in the light of experience, new methods may be adopted and the existing arrangements strengthened.

IV

DENOTIFIED TRIBES

28. Since the denotification of tribes, formerly described as 'criminal', various schemes for their rehabilitation and development have been taken up in the States. The Third Plan provides Rs. 4 crores as against the anticipated outlay during the First and the Second Plans of about Rs. 1 crore and Rs. 2·9 crores respectively. The repeal in 1952 of the Criminal Tribes Act, 1924, embodies a fundamental change in the approach towards ex-criminal tribes from surveillance and punishment to correction, rehabilitation and assimilation into the wider community. Although the total population of these tribes is estimated at about 4 million, they are divided into a large number of groups, each with its own local and traditional background and distinctive features. Some of these tribes are also listed among scheduled castes. The rehabilitation of these tribes presents many problems. Lacking in education, isolated from others, as a rule they are also inadequate as cultivators, and age-old attitudes take time to change. On the whole, the economic development programmes undertaken in recent years in the interest of the denotified tribes have had very limited impact except where groups of persons could be settled in colonies and developed into a stable and fairly prosperous community. For economic, educational and social programmes to succeed, it is essential that voluntary workers and

suitable norms for salaries and other terms and conditions of service. There is also greater need for providing orientation and training for voluntary welfare workers.

4. A variety of welfare services have been developed in recent years through financial support provided by the Central and State Governments. After each phase of devlopment, adequate arrangements have to be made for the continuance of the new services on a permanent basis. The resources provided under the Third Plan are being utilised both for expanding the existing welfare services and for assisting voluntary organisations to continue those already established. To this extent, development of new services tends to be limited. In the interest of future development it will be desirable to distinguish between arrangements required to enable voluntary organisations to maintain the services already established and the resources provided for new development. Voluntary organisations can be encouraged through financial assistance to promote needed welfare services in areas where they do not exist and also to initiate new welfare services not hitherto undertaken.

5. A stage has reached in the development of welfare services when, for the better utilisation of the available resources and improvement in the quality of the services offered, it is essential that the various Government agencies concerned, both at the Centre and in the States, should achieve a larger measure of coordination among themselves. This would avoid duplication and overlapping in considering requests, providing assistance for similar purposes, and parallel approach on the part of voluntary organisations to more than one Government agency. At the same time, it is essential that voluntary organisations themselves should develop along specialised lines, each selecting a limited area of activity in which its workers gain experience and intimate knowledge of problems.

6. In its very nature, progress in social welfare is difficult to measure. Its true tests are the numbers of voluntary workers who participate in social welfare activities and the response from each local community towards the solution of its social problems. Whatever the shortcomings—and there are bound to be many in so difficult a field—the record of work over the past decade has been in many ways outstanding. About 6000 voluntary welfare organisations in different parts of the country have been assisted by the Central and State Social Welfare Boards. Of these, about 2900 were engaged in work for the welfare of women and about 2400 in work relating specially to child welfare. In the course of the Second Plan, assistance amounting to about Rs. 2·6 crores was given to more than 3700 voluntary welfare organisations. Among others, activities for which the Central and State Social Welfare Boards have been responsible are the establishment of 75 urban community centres, 21 production units to assist women to supplement their incomes, and 42 night shelters in urban areas. A large number of adult women were enabled through condensed

CHAPTER XXXV

WELFARE PROGRAMMES

SOCIAL WELFARE

THE economic and social aspects of a plan of development are closely interconnected. Several of the social programmes in the Third Plan have been outlined in earlier Chapters. This Chapter is devoted to the consideration of three important welfare programmes, namely, those relating to social welfare, prohibition and rehabilitation of displaced persons.

2. Development over the past decade of social welfare activities as an integral part of the First and Second Plans has a significance which extends beyond the range of services established or the extent of resources utilised. They express the concern of the community for the welfare of its many vulnerable sections and emphasise an essential value in national development. In drawing large numbers of voluntary workers, specially women, into the field of creative social service, the community is itself enriched and strengthened. Inevitably, extension in a field of activity as varied and dispersed as social welfare brings its own problems, and these call for systematic review from time to time of what has been achieved and of the measures needed to improve the quality of welfare services. Moreover, with the establishment of democratic institutions at the district and block level, the manner in which the voluntary organisations might fulfil the tasks assigned to them will need further consideration.

3. The social welfare programmes, which have been implemented by voluntary organisations with the assistance of the Central and State Governments, include, amongst others, welfare extension projects undertaken by the Central and State Social Welfare Boards, programmes relating to social defence, social and moral hygiene and after-care services and other welfare programmes. Welfare services are directed in particular towards sections of the community which need special care and protection. In developing them, the object is to replace individual and haphazard relief and charity by organised and sustained activity for education, welfare and rehabilitation undertaken with the general support of the community. Increasingly, instead of being merely institutional, welfare services will have to be community and family-oriented. Preventive services will continue to play an important role. Mental hygiene services like student and youth counselling, child guidance clinics and marriage counselling deserve special emphasis. As these services develop, greater need is felt for trained personnel. With large numbers of voluntary organisations employing paid personnel, it is also essential to standardise their training and to establish

(3) continuance of welfare extension projects coordinated with the community development programmes for a full period of five years;

(4) socio-economic programme for women;

(5) condensed courses of training for adult women to enable them to take up vocational training and employment;

(6) urban welfare projects;

(7) night shelters;

(8) holiday homes for children; and

(9) social welfare administration and technical guidance to aided institutions.

Considerable emphasis is being placed in the Third Plan on child welfare programmes. In addition to continuing work initiated during the Second Plan, it is proposed to take up in each State and Union Territory at least one pilot project in child welfare on the basis of complete coordination in services provided by medical and public health, education, social welfare and other agencies. It is hoped that these pilot projects will suggest ways of securing the integrated functioning of different services, many of which already exist. It is also proposed to undertake pre-school education schemes and a training programme for child welfare workers (balsevikas). This training programme forms part of a scheme for improving existing child welfare centres (balwadis) and opening new ones.

10. In the programme for social defence, priority is given to schemes for the prevention and treatment of juvenile delinquency, social and moral hygiene and suppression of immoral traffic in women and girls. It is proposed to begin a systematic attack on the problem of beggary. In developing probation and aftercare services, it should be ensured that women and children are specially assisted. To deal with the problem of commercialised prostitution, the Suppression of Immoral Traffic Act was passed in 1956. In pursuance of this Act, the necessary institutions for the custody, training and rehabilitation of the women and girls affected are being established. In the course of the Second Plan, 10 protective homes, 16 rsecue homes and 70 reception centres have been established. Additional centres will be set up in the Third Plan. Apart from setting up these centres, it is important to consider how the present programme for social defence could be worked even more effectively and the lines along which the community and the family could participate more fully in the work of rehabilitating women and girls.

courses to attain the minimum educational qualifications necessary for further vocational training and employment. An important step was taken during the First Plan with the setting up of welfare extension projects, each serving some 25 villages, and providing maternity and child health services, craft classes, social education for women and care of children through balwadis. These projects, along with 134 more established during the Second Plan, have now been made over to mahila mandals with financial assistance from the Central Social Welfare Board. In addition, 337 welfare extension projects were established during the Second Plan in coordination with the community development programme, resources being obtained in part from the Central Social Welfare Board and in part from State Governments and the community development block budgets.

7. During the Second Plan. a total outlay of about Rs. 15 crores have been incurred on social welfare. Among the main development programmes may be mentioned welfare extension projects and the assistance given to voluntary organisations by the Central Social Welfare Board, (about Rs. 10 crores), social defence, social and moral hygiene and after-care services, and welfare schemes of State Governments (about Rs. 5 crores). Under the programme for social defence, social and moral hygiene and aftercare services 327 institutions have been established and 128 probation and welfare officers have been appointed.

8. In the Third Plan, provision has been made for programmes involving a total outlay of Rs. 28 crores—Rs. 16 crores at the Centre and Rs. 12 crores in the States. The programmes of the Central Social Welfare Board, including assistance to voluntary organisations and welfare extension projects, envisage a total outlay of Rs. 12 crores. In addition, schemes for child welfare and pre-primary education with a provision of Rs. 3 crores have been included, under 'Education'. Other schemes to be implemented under social welfare relate to urban community welfare projects, training, research and surveys, social defence and aftercare and the setting up of a Central Bureau of Correctional Administration. It is also proposed to make a small beginning in the direction of assisting certain categories of persons without any means of livelihood or support—the physically handicapped, old persons unable to work, women and children.

9. The following are the principal programmes to be undertaken by the Central and State Social Welfare Boards during the Third Plan:

(1) grants to about 6000 voluntary organisations;

(2) assistance to mahila mandals to provide services at about 1700 centres in the welfare extension projects entrusted to them;

programmes in small industries and agriculture should also be organised for them. Begging by able-bodied persons should be a public offence.

16. Religious mendicants constitute a varied group, and at the present stage it would be desirable to approach their problems through organisations like the Bharat Sadhu Samaj and others.

17. It would be desirable to undertake Central legislation for the control and eradication of beggary and vagrancy.

18. In recent years there has been progress in developing special services and facilities for physically and mentally handicapped persons, specially those who are blind, deaf and dumb, and those who are orthopaedically handicapped and mentally deficient. For each category, the primary object of the services provided for these groups should be to enable them to rehabilitate themselves through work. Since many persons in these groups come from rural areas, where traditionally the community readily provides a measure of help, it would be desirable to give a rural bias to the training and rehabilitation programmes for these groups. Facilities for enabling handicapped persons to find work have been provided at a few employment exchanges. Local bodies and voluntary organisations are already playing a significant role in serving handicapped persons. Their services should be further developed along the following lines:

(a) teaching handicapped persons in their homes;

(b) providing work in the homes or in the neighbourhood for those not able to move;

(c) providing recreational facilities for the handicapped, the aged and the infirm; and

(d) providing assistance by way of special aids.

During the period of training for new employment, there should be provision for financial assistance, stipends, etc.

19. Urban community development has immense potentialities for bringing about social and environmental change in urban communities despite their hetrogenous character. The success of this programme will depend by and large on the extent of self-help evinced by the people, the role of the official being essentially to supplement voluntary efforts. There is a large scope in this field of work for voluntary organisations and the Lok Karya Kshetra, and Corporations and municipalities could make fuller use of their services. A few pioneering experiments tackling successfully difficult urban conditions through schemes of urban community development involving people's support, initiative and their mobilisation have been already taken in hand.

11. Efforts have been made during the Second Plan to deal with the problems of juvenile delinquency. Among the new institutions established are 40 remand homes, 17 certified schools and 5 borstal schools. Several States already have special legislation dealing with children, but there are varying provisions regarding the age limit and the categories of juvenile offenders. With the passing of the Children's Act of 1960, which applies to Union Territories, it is suggested that, on essential matters, there should be uniformity throughout the country. In dealing with juvenile delinquency and victims of commercialised prostitution and immoral traffic, probation officers have an important role. In the Second Plan their number was increased by 100 to a total of 304. In the Third Plan, it is proposed to appoint 112 more probation officers.

12. Beggary is an age-old social evil which has been allowed to continue far too long and, apart from the demoralisation it causes, is a source of discredit to the country. The problem has been studied in several places and it is important that States and local bodies should now endeavour to deal with it effectively. In the first instance, beggary should be eradicated from large cities, places of pilgrimage and tourist centres. Broadly, beggars fall into four groups, namely (a) child beggars, (b) those who are diseased, disabled, infirm or aged, (c) able-bodied and professional exploiters, and (d) religious mendicants.

13. The problem of child beggars should be first isolated as children who take to begging are often victims of gangs of exploiters. There should be special police units for dealing with juveniles, including vagrants, delinquent children and children in the pre-delinquent stage. The Indian Penal Code provides for severe punishment of persons found guilty of exploiting children for anti-social purposes and kidnapping or maiming children for the purpose of begging. Children's Acts also provide for protection against exploitation of children for anti-social purposes, including beggary. Thus, the necessary legislation already exists, and the main task now is to ensure its effective enforcement.

14. Beggars in the second group who are diseased, disabled, infirm or aged, should be taken care of in residential institutions run by voluntary welfare organisations. Besides, assistance from State Governments and local bodies and support from the community, these organisations could be assisted in a small way from the special fund referred to in the Chapter on Labour Policy, under which it is proposed to make a beginning by way of relief and assistance for three groups of persons—the physically handicapped, old persons unable to work, women and children.

15. Able-bodied beggars should be rounded up and sent to work camps to be organised at the sites of various projects. Rehabilitation

21. The Second Plan recommended the setting up a Central Committee to review the progress of prohibition programmes, to coordinate activities in different States and to keep in touch with their practical problems. It was also proposed that Prohibition Boards and district prohibition committees should be set up in the States and there should be Administrators of Prohibition to implement the programme. The Ministry of Home Affairs constituted a Central Committee which met towards the end of 1960.

22. Prohibition is essentially a social welfare movement. Its success as a voluntary movement for social reform depends on a number of conditions, in particular on—

(1) its acceptance as public policy accompanied by concrete administrative steps to make the policy a reality;

(2) support of a large section of public opinion and active participation on the part of leading voluntary organisations and large numbers of social workers;

(3) finding practical solutions to problems such as employment and arranging for the utilisation and processing of products which would otherwise be used for the production of liquor; and

(4) enabling State Governments to meet possible loss of revenue on account of the progress of prohibition.

23. The question of loss of revenue may be considered first. As the Second Plan explained, in considering any basic social policy, financial considerations, although of great practical importance, are not to be treated as decisive in character. The possible loss of resources on account of prohibition may itself be a temporary rather than a permanent effect and on balance may turn out to be smaller than is sometimes reckoned. If the movement for prohibition proceeds on the right lines—and this is the assumption on which proposals for prohibition should rest—it should make for a healthier life for the individual and the community, should help make the individual worker and his family more productive, and should augment national savings. Nevertheless, in the initial stages, it may be that as a result of measures introduced in pursuance of prohibition the revenue from excise may fall below the estimates which States have taken into consideration while formulating their plans. This aspect should be considered further by the Central and State Governments. Obviously, financial reasons alone could not lead to a fundamental break in carrying out a social programme which is considered necessary in the interest of the mass of the people throughout the country.

24. Given this approach to the financial aspects of prohibition it should be possible for each State to consider further steps. It is not

PROHIBITION

20. In March 1956, the Lok Sabha passed the following resolution:

> "This House is of opinion that Prohibition should be regarded as an integral part of the Second Five Year Plan and recommends that the Planning Commission should formulate the necessary programme to bring about nation-wide Prohibition speedily and effectively."

In pursuance of this resolution, a number of recommendations were made in the Second Five Year Plan. It was pointed out that prohibition had already been accepted as a Directive Principle in the Constitution and there was need to adopt a common national approach towards it. State Governments should draw up their own phased programmes along lines broadly agreed for the country as a whole and there should be provision for constant review and assessment. As a first step, it was suggested that advertisements and public inducements relating to drink should be discontinued and drinking in public premises (hotels, hostels, restaurants, clubs, etc.), and at public receptions should be stopped. A series of other steps to be taken subsequently were also suggested. These were—

(1) progressive reduction in the number of liquor shops both in rural and urban areas;

(2) closing of liquor shops for an increasing number of days during the week;

(3) reduction of quantities supplied to liquor shops;

(4) progressive reduction in the strength of distilled liquor produced by distilleries in India;

(5) closing of shops in and near specified industrial and other development project areas;

(6) removal of shops to places away from the main streets and living quarters in towns and villages;

(7) taking active steps to encourage and promote the production of cheap and healthy soft drinks;

(8) assistance of voluntary agencies in organising recreation centres; and

(9) inclusion of prohibition as an item of constructive work in community development areas and in social welfare extension projects.

Action has been taken in a number of States on the suggestions mentioned above, but for the country as a whole, progress has been slow.

REHABILITATION OF DISPLACED PERSONS

26. After Partition, about 8·9 million persons migrated from Pakistan into India, about 4·7 million from West Pakistan and the rest from East Pakistan. At the census of 1951 the number of displaced persons had been reckoned at about 7·5 million. Between 1947-48 and 1960-61 a total outlay of about Rs. 239 crores was incurred on the rehabilitation of displaced persons. Of this amount, about Rs. 133 crores were spent for displaced persons from West Pakistan and about Rs. 106 crores for those from East Pakistan. Relief and other operations entailed a total outlay of Rs. 128 crores. The following Table shows outlays on rehabilitation before the First Plan and during the first two Plans:

Progress of expenditure on rehabilitation since 1947-48

(Rs. crores)

	West Pakistan	East Pakistan	total
before First Plan	62·34	8·53	70·87
First Plan	55·70	41·85	97·55
Second Plan	14·95	55·37	70·32@
total	132·99	105·75	238·74

DISPLACED PERSONS FROM WEST PAKISTAN

27. The rehabilitation of displaced persons from West Pakistan was undertaken in the main before and during the First Plan. The distribution of expenditure under different rehabilitation programmes is shown in the Table below:

Outlay on rehabilitation of displaced persons from West Pakistan

(Rs. crores)

programmes	before First Plan	First Plan	Second Plan	total
urban loans	11·38	3·66	0·09	15·13
rural loans	6·71	2·16	0·43	9·30
housing	25·17	32·08	5·41	62·66
industries	..	..	2·62	2·62
Rehabilitation Finance Administration	2·28	8·00*	..	10·28
education and vocational training	16·80*	9·80	6·40	33·00
total	62·34	55·70	14·95	132·99

28. The greater part of the work relating to the resettlement on land of displaced landholders from West Punjab and persons of Punjabi extraction from other parts of West Pakistan was completed by 1950-51. Evacuee lands in the Punjab were allotted on a quasi-permanent basis to about 477,000 displaced landholders; in addition, about 33,000 families of tenants were settled on land. Land was also allotted on a temporary basis outside Punjab, specially in Rajasthan, to about 58,000 persons. Under the Displaced Persons (Compensation and Rehabilitation) Act, 1954, quasi-permanent rights in land of about 270,000 allottees have since been converted into proprietory rights. The programme of rural rehabilitation also included grants of loans for building houses and for schemes

@Outlay anticipated is about Rs. 63 crores.

* Includes outlay on displaced persons from East Pakistan also.

envisaged that States should fix target dates for introducing complete prohibition, for such target dates are in practice difficult to work out or to adhere to. However, a country-wide approach would make it easier for all States to ensure implementation and to check inter-State and inter-district smuggling. The various measures recommended in the Second Plan constitute a limited but practical programme which should be implemented in the course of the next two or three years. It should be possible also for States which have introduced prohibition in some districts to extend it steadily to other areas, care being taken to provide for appropriate dry belts between districts which have prohibition and those in which prohibition has not yet been introduced. Periodical review and evaluation of progress would suggest further steps. In pursuing the programme for prohibition two important considerations should of course be kept in view. Firstly, the customs and traditions of the tribal people must be fully respected. Secondly, due attention must be given to the convenience and requirements of foreign visitors and tourists and of foreign missions.

25. The question of the means to be employed and the agencies available is of special importance in a programme like prohibition. Obviously, if prohibition were to rest primarily on enforcement by the police and by excise staff, not much progress could be made. The main reliance has therefore to be on—

(a) the creation of a growing public opinion in favour of prohibition conceived as a social welfare measure in the interest of the general mass of the people;

(b) voluntary organisations, who should be given the necessary support and assistance by the Government in carrying out social and educational programmes;

(c) implementation of various development programmes undertaken by government agencies in education, health, social welfare etc. with due emphasis on the significance of prohibition; and

(d) availability in canteens of cheap and nutritious food and non-alcoholic beverages and encouragement of sports, and recreational activities on a group and community basis.

With a view to achieving greater progress in these directions, it would be useful to provide financial assistance to voluntary organisations for educational and promotional work among the people and also to give a measure of support to other activities which would assist the progress of prohibition. This could be done in large part from within the provisions in the Plan for "public cooperation". The amounts involved would not be considerable, and an appreciable beginning could be made.

32. Upto the end of the First Plan, about 500,000 families were rehabilitated in the eastern zone. Of these, about 400,000 were settled on land and in other ancillary occupations in rural areas. For the Second Plan it was estimated that about 170,000 families would have to be rehabilitated. Owing to pressure on land in West Bengal schemes were formulated for settling displaced persons in other States. In all about 78,000 families were settled in rural areas. Housing loans were advanced to about 38,000 families and a number of colonies were developed. Employment through large and small industries was given to about 14,000 persons. Twenty-one schemes for large and medium industries were approved by the Rehabilitation Industries Corporation, which was set up with an authorised capital of Rs. 5 crores for putting up industries of its own or in collaboration with private enterprise at centres with large concentrations of displaced persons. Vocational and technical training was given to 28,000 displaced persons during the First Plan and to 22,000 during the Second Plan. Medical facilities were also considerably augmented. A large number of schools and colleges were established in West Bengal with a view to providing expanded educational facilities to meet the requirements of the displaced population.

33. The development of the Dandakaranya project was taken up in the Second Plan with the object primarily of settling families of displaced persons from East Pakistan who were still in 'camps' in West Bengal and, along with this, for promoting the welfare of the local population, specially the adivasis. Since the inception of the project, over 21,000 acres of land have been cleared and over 13,000 acres fully reclaimed. About 3700 acres have been brought under follow-up cultivation and about 3200 acres of reclaimed land have been placed at the disposal of district authorities for allotment to tribals against the 25 per cent share that has been reserved for them. Special attention has been given to the development of fisheries and poultry. The construction of the Bhaskal dam in the Umarkote area which commands an area of 13,750 acres has been approved. Surveys of dams commanding over 90,000 acres have been completed, and detailed projects are being prepared. Other programmes such as malaria eradication, provision of health facilities, expansion of educational facilities etc. are also being carried out. Upto the end of February 1961, 2391 displaced families comprising 10,599 persons had moved to the Dandakaranya area. Families settling on land are being assisted with loans for the purchase of bullocks, milch cattle, implements etc.

Programme for the Third Plan

34. The task of rehabilitating displaced persons is gradually coming to an end. In respect of displaced persons from West Pakistan, provisions in the Third Plan are limited mainly to residual requirements for housing schemes and assistance for educational and health services. For displaced

of agricultural improvement, the total amount advanced being Rs. 9·3 crores. Rural rehabilitation was greatly facilitated by the availability of evacuee lands, although these were on the whole considerably smaller in extent and of lesser value than those abandoned in West Pakistan.

29. Displaced persons from urban areas were faced with problems of a different and in some ways more complex character. The displaced population had to be provided shelter and enabled to start life afresh in trade, industry and professions, and educational and health services had to be augmented to meet their urgent needs. Housing had to be provided for nearly 2·5 million displaced persons, of whom only about one-half could be accommodated in evacuee properties. In all, 19 fully developed townships and 136 new colonies were constructed and provided with educational, health and other civic amenities, the total number of houses and tenements constructed being about 155,000. To assist displaced persons in rehabilitating themselves in business and industry, small urban loans of the value of Rs. 15·13 crores were advanced to displaced persons, in addition to loans amounting to Rs. 10·28 crores advanced by the Rehabilitation Finance Administration. Financial assistance was also extended for 23 schemes for medium industries and for cottage and small-scale industries.

30. To assist the education of children of displaced persons, new schools and colleges were started and many existing institutions helped to expand their capacities. A number of displaced educational institutions were assisted in establishing themselves at new centres. Vocational and technical training was given to 110,000 persons.

Displaced Persons from East Pakistan

31. The rehabilitation of displaced persons from East Pakistan falls mainly within the First and Second Plans. The problem of rehabilitation of displaced persons from East Pakistan was rendered specially difficult in view of the continuing nature of the influx over many years and the heavy pressure on land and economic life in West Bengal. The distribution of outlay under different heads was as follows:

Outlay on rehabilitation of displaced persons from East Pakistan

(Rs. crores)

programmes	before First Plan	First Plan	Second Plan	total
urban loans	1·63	5·50	1·87	9·00
rural loans	2·27	14·36	12·12	28·75
housing	4·63	15·52	17·61	37·76
industries	..	0·71*	3·55	4·26
Rehabilitation Finance Administration	..	..	0·98*	0·98
education and vocational training	..	5·76	9·36	15·12
medical	..	..	2·13	2·13
Dandakaranya project	..	..	7·75	7·75
total	8·53	41·85	55·37	105·75

*Includes outlay on displaced persons from West Pakistan also.

period and merges into the larger efforts to rebuild the economy of the nation and especially of those States and regions which have borne the greatest burdens. Within the expanding national economy greater integration between rehabilitation and development helps the speedy economic assimilation of displaced persons.

Almost fifteen years ago, the challenge of rehabilitation came with bewildering suddenness and immensity, and there have been critical moments since. Nevertheless, one by one, in the midst of the travail through which millions have lived and despite shortcomings, the major problems of the displaced persons are being resolved and the foundations of a new life well and truly laid.

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persons from East Pakistan, the two specific objectives are the rehabilitation of 28,600 families residing in camps and other centres in West Bengal and of about 200,000 partially rehabilitated displaced families living in West Bengal. Although financial provision is being made for them under Rehabilitation, the administration of a number of rehabilitation schemes has been transferred from the Ministry of Rehabilitation to the Central Ministries concerned, as for instance, the Rehabilitation Industries Corporation, financial assistance for displaced students, reservation of beds and hospitals etc. Schemes of assistance for the provision of education and health services and training schemes are also proposed to be integrated progressively into the plans of States. Programmes formulated by the Ministry of Rehabilitation in consultation with the State Governments concerned add up to a total outlay of Rs. 74 crores, about Rs. 41 crores being intended for the rehabilitation of displaced persons from East Pakistan, about Rs. 26 crores for the Dandakaranya project and about Rs. 7 crores for rehabilitation of displaced persons from West Pakistan. The Third Plan at present envisages a provision of Rs. 40 crores. However, since the object is to complete rehabilitation in as short a period as may be feasible and rehabilitation programmes have special features of their own, it is proposed that financial provisions required for carrying out the essential programmes should be made each year in the light of the actual progress in rehabilitation and the tasks still outstanding.

35. A few of the principal items in the programme of rehabilitation of displaced persons from East Pakistan may be briefly mentioned. It is hoped that about 18,000 agricultural families will be rehabilitated on land—about 3000 families in West Bengal and Uttar Pradesh, and the remaining families in the Dandakaranya area. Urban loans are expected to be given to about 12,000 families. Loans will also be given to agriculturists for irrigation, reclamation and purchase of agricultural requisites. A substantial programme for the construction of housing units and grant of urban house building loans has been drawn up. Provision has also been made for loans for small scale as well as medium industries. The Plan provides, amongst other things, for educational facilities for the children of displaced persons who are at present in the camps, for assistance to private educational institutions catering to the needs of displaced persons and for aid to needy and deserving displaced students. The Plan also provides for vocational and technical training and for medical facilities for displaced persons in West Bengal. Programmes for the Dandakaranya area are being formulated in detail. They include schemes for land reclamation, irrigation, road development, loans and grants for rehabilitation and provision for educational and social services.

Rehabilitation and Development

36. In its closing phases, rehabilitation of displaced persons takes the form more and more of specific tasks remaining over from an earlier

APPENDICES

Appendix A : Selected Economic Indicators

A-I : Selected economic indicators, 1950-51—1960-61

A-II : Index numbers of wholesale prices, 1950-51—1960-61

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Appendix B : Expenditure and Outlay in First, Second and Third Plans

B-I : Outlays in First and Second Plans—year-wise

B-II : Estimated expenditure in Second Plan and outlays in Third Plan—States

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Appendix C : Notes on Population and Employment

I : Population projections for the Fourth and Fifth Plans

II : Estimates of additional employment in the Third Plan

CONCLUSION

In the Report we have stressed the range and magnitude of the tasks which India has to accomplish during the Third Plan. These will strain our resources to the utmost and will call for the very best that the nation and each of its citizens can offer. Given a sense of urgency and a spirit of dedicated endeavour, it is fully within the capacity of the nation to achieve the goals it has set itself.

JAWAHARLAL NEHRU
Chairman

GULZARILAL NANDA
Deputy Chairman

MORARJI R. DESAI
V. K. KRISHNA MENON
C. M. TRIVEDI
SHRIMAN NARAYAN
T. N. SINGH
A. N. KHOSLA
P. C. MAHALANOBIS
Members

VISHNU SAHAY
Secretary

TARLOK SINGH
Additional Secretary

August 3, 1961.

APPENDIX A

Statement A-I : Selected economic indicators, 1950-51—1960-61

item	1950-51	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60	1960-61
1	2	3	4	5	6	7	8	9	10	11	12
national income (at 1960-61 prices) (Rs. crores) . .	10240	10515	10930	11590	11880	12130	12710	12590	13510	13680	14500
money supply (a) (Rs. crores) . .	1979	1804	1765	1794	1921	2184	2313	2388	2499	2703	2908
scheduled bank deposits (a) (Rs. crores)	906	878	844	856	951	1051	1186	1481	1668	1935	1910
plan outlay (Rs. crores) . .	..	259·6	267·6	343·0	475·9	614·1	632·8	884·2	1001·4	1010·5	1071·0
deficit financing (Rs. crores) . .	..	2	44	36	94	157	253	496	136	112	(—)49
index of wholesale prices (b) (base : 1952-53=100) .	125·2	99·9	100·8	100·3	90·8	98·1	105·6	105·4	112·3	118·9	127·5
cost of living index (base : 1949=100)	101	105	104	106	99	96	107	112	118	123	124
index of employment (organised sectors) (base : 1950-51=100)	100·0	99·3	102·0	101·0	103·5	104·0	111·2	115·9	114·9	119·0	121·0(c)
index of wages . (base : 1950-51=100)	100·0	107·1	115·0	114·9	114·9	121·3	125·0	127·6	132·6	135·0(c)	137·0(c)
index of agricultural production . . (base : 1949-50=100)	95·6	97·5	102·0	114·3	117·0	116·8	124·0	114·6	132·3	127·2	135·0
index of foodgrains production . . (base : 1949-50=100)	90·5	91·1	101·1	119·1	115·0	115·3	120·8	107·9	130·1	124·3	131·6
index of industrial production . . (base : 1950-51=100)	100·0	112·2	113·4	117·3	129·1	138·6	151·0	152·5	157·2	175·0	194·3
imports (Rs. crores) .	650	963	633	592	684	761	1100	1234	1030	924	1075
exports (Rs. crores) .	616	730	602	540	597	641	635	668	576	623	625

(a) As on last Friday of the financial year.
(b) Figures correspond to the average of weeks for the month of March,
(c) Estimated.

1955-56												
June	83·7	69	76	60	82·3	95·0	93·3	93	116	74	98·2	89·7
September	85·3	75	81	68	79·5	94·1	94·5	95	113	81	98·3	90·6
December	87·5	77	76	80	79·6	95·2	101·9	102	110	92	100·2	93·5
March	92·8	86	86	85	78·7	96·8	109·4	107	122	106	102·9	98·1
1956-57												
June	99·0	93	85	82	80·5	98·7	112·9	111	113	116	103·5	102·1
September	103·6	99	101	87	83·6	106·2	116·8	109	122	124	109·0	106·9
December	105·1	97	94	94	87·7	106·8	119·4	109	138	124	108·8	108·1
March	102·3	99	97	95	87·2	106·5	117·3	113	133	119	106·2	105·6
1957-58												
June	109·4	104	107	89	92·3	112·0	121·4	112	146	125	108·6	110·7
September	108·5	103	108	87	93·7	115·0	115·4	100	133	121	108·6	109·5
December	104·0	98	102	86	97·7	114·9	115·4	105	129	119	107·8	107·1
March	102·3	95	100	84	94·9	114·3	111·3	103	120	113	107·6	105·4
1958-59												
June	113·4	106	111	93	92·1	115·9	115·2	100	123	124	107·9	111·7
September	121·2	115	118	105	90·9	116·1	119·0	99	118	137	108·9	116·5
December	113·3	105	98	114	96·4	115·1	112·5	99	110	122	108·3	111·4
March	113·8	102	92	114	100·3	116·0	116·0	102	114	128	108·6	112·3
1959-60												
June	118·7	102	102	93	97·6	115·9	120·3	105	114	135	109·1	115·6
September	120·5	108	111	98	99·7	116·3	122·6	102	119	136	110·0	117·2
December	118·2	101	101	96	103·7	117·0	127·2	111	140	131	113·4	107·8
March	117·0	103	106	98	96·4	117·3	131·9	113	141	141	116·8	118·8
1960-61												
June	120·3	107	114	87	109·5	118·0	139·7	112	187	144	119·9	122·9
September	123·9	109	114	90	104·5	119·8	138·7	112	180·6	147	122·7	125·3
December	117·0	100	102	89	112·1	120·3	149·5	110	226·1	154	126·0	124·6
March	117·5	100	101	91	113·4	122·7	150·1	111	270·9	160	129·4	127·5

Statement A-II: Index numbers of wholesale prices, 1950-51—1960-61

(base : 1952-53=100)

(average of weeks for the relevant months)

period	food articles	cereals	rice	wheat	liquor and tobacco	fuel, power, light and lubricants	industrial raw materials	raw cotton	raw jute	oil-seeds	manufactures	general index
1	2	3	4	5	6	7	8	9	10	11	12	13
1949-50												
March	108.3	92	87	98	91·6	91·1	119·1	93	128	132	98·9	106·4
1950-51												
June	111·4	91	90	90	96·0	90·1	122·0	100	127	136	98·7	108·4
September	116·9	94	94	93	103·8	92·3	127·0	104	128	147	100·7	112·8
December	109·2	97	96	99	100·7	93·7	132·8	128	127	144	103·5	110·6
March	112·4	100	100	100	112·9	97.5	153·7	144	204	149	118·7	120·2
1951-52												
June	116·9	104	110	93	115·3	95·4	166·8	128	314	154	123·2	126·4
September	113·7	105	109	95	125·4	94·1	132·0	121	172	130	117·6	117·3
December	110·2	99	99	93	130·0	97·6	136·6	135	193	129	119·9	117·1
March	93·7	95	97	90	121·5	98·0	103.2	109	134	85	107·6	99·9
1952-53												
June	97·9	100	103	96	104·7	99·1	98·0	102	113	88	101·2	99·1
September	103·7	102	102	100	98·3	101·4	106·1	109	104	107	100·7	103·0
December	96·5	97	95	100	95·5	99·7	93·8	90	89	96	97·5	96·4
March	102·2	100	99	102	92·8	98·8	101·5	96	82	115	98·9	100·8
1953-54												
June	113·3	104	107	95	99·0	98·9	113·7	99	101	137	100·1	108·8
September	111·7	103	107	95	101·7	99·8	113·8	101	95	137	98·8	107·7
December	101·6	92	93	92	99·2	98·5	107·2	105	108	111	98·1	101·4
March	98·6	88	87	88	96·0	98·0	106·2	108	98	109	100·6	100·3
1954-55												
June	97·3	82	88	69	94·3	98·5	103·1	103	95	102	101·1	99·3
September	100·4	85	90	76	94·1	96·8	100·5	100	99	95	100·8	100·3
December	87·7	73	74	72	83·8	96·5	100·9	104	123	84	99·8	93·4
March	82·9	70	72	71	86·0	95·7	97·2	92	142	71	101·1	90·8

Statement A-V : Rural and urban population 1951 and 1961

(in millions)

State/Union Territory	1951			1961		
	urban	rural	total	urban	rural	total
1	2	3	4	5	6	7
1 Andhra Pradesh	5·44	25·82	31·26	6·26	29·72	35·98
2 Assam	0·41	8·63	9·04	0·89	10·97	11·86
3 Bihar	2·62	36·16	38·78	3·92	42·54	46·46
4 Gujarat } 5 Maharashtra }	13·65	34·61	48·26	5·28	15·34	20·62
				11·03	28·47	39·50
6 Jammu and Kashmir	..	..	4·41	0·60	2·98	3·58
7 Kerala	1·78	11·77	13·55	2·53	14·34	16·87
8 Madhya Pradesh	3·13	22·94	26·07	4·63	27·76	32·39
9 Madras	7·31	22·66	29·97	8·99	24·66	33·65
10 Mysore	4·45	14·95	19·40	5·19	18.36	23·55
11 Orissa	0·60	14·05	14·65	1·11	16·45	17·56
12 Punjab	3·07	13·06	16·13	4·08	16·22	20·30
13 Rajasthan	2·96	13·01	15·97	3·23	16·91	20·14
14 Uttar Pradesh	8·63	54·59	63·22	9·48	64·27	73·75
15 West Bengal	6·28	20·02	26·30	8·10	26·87	34·97
16 Andaman and Nicobar Islands	..	..	0·03	0·01	0·05	0·06
17 Delhi	1·44	0·31	1·75	2·34	0·30	2·64
18 Himachal Pradesh	0·05	1·06	1·11	0·06	1·29	1·35
19 Laccadive, Minicoy and Amindivi Islands	..	0·02	0·02	..	0·02	0·02
20 Tripura	0·04	0·60	0·64	0·10	1·04	1·14
21 Manipur	..	..	0·58	..	..	0·64
22 NHTA (Nagaland)	..	..	0·56	..	..	0·61
23 NEFA	..	..	0·14	..	..	0·18
24 Pondicherry	..	..	0·03	..	..	0·03

NOTE : In the 1951 Census all places with a population of 5000 and over as also some places with a population of less than 5000 but possessing definite urban characteristics were treated as urban. In the 1961 Census the population of a place has been taken as urban only if it satisfies the following three tests : (i) a population of not less than 5000, (ii) a density of not less than 1000 per square mile and (iii) at least three-fourths of the adult male population should be employed in persuits other than agriculture.

Statement A-III: Index numbers of agricultural production (a)

(base : 1949-50=100)

commodity/group	1950-51	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60	1960-61
1	2	3	4	5	6	7	8	9	10	11	12
rice	87·9	90·1	96·8	118·6	105·8	114·2	120·4	104·8	127·6	123·3	134·6
wheat	101·1	93·9	112·7	120·0	135·4	131·3	140·7	116·5	147·1	146·5	151·0
all cereals	90·3	91·2	101·4	120·1	114·5	114·9	120·5	108·5	129·3	125·3	132·6
pulses	91·7	90·3	98·8	112·0	118·5	118·4	122·9	104·2	135·2	117·2	125·5
all foodgrains	90·5	91·1	101·1	119·1	115·0	115·3	120·8	107·9	130·1	124·3	131·6
oilseeds	98·5	97·4	91·9	103·7	122·6	108·6	120·3	115·6	133·4	122·5	136·9
sugarcane	113·7	122·8	101·6	89·5	115·9	119·8	137·2	134·7	139·4	148·5	156·7
cotton	110·7	119·2	121·0	151·8	163·6	153·9	181·2	179·7	178·0	145·7	193·8
jute	106·3	151·4	148·6	100·0	94·8	135·8	138.7	131·0	158·6	139·8	122·9
tea	103·8	109·6	115·4	100·6	110·4	107·2	108·7	116·9	122·9	124·0	124·9
coffee	112·3	112·7	125·9	146·5	151·8	196·1	204·1	229·8	241·2	245·7	252·6
rubber	93·8	94·4	106·1	131·8	127·6	146·1	143·4	140·1	143·4	137·9	155·5
all commodities	95·6	97·5	102·0	114·3	117·0	116·8	124·0	114·6	132·3	127·2	135·0

Statement A-IV : Index numbers of industrial production

(base : 1950-51=100)

group	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60(b)	1960-61(b)
1	2	3	4	5	6	7	8	9	10	11
cotton textiles	109·3	116·6	123·7	126·7	127·9	134·7	127·3	123·4	127·5	133·1
chemicals and chemical products	114·9	135·0	144·2	162·9	179·3	192·1	203·6	233·2	260·1	288·1
iron and steel	111·0	107·3	106·0	119·7	121·6	126·7	126·3	130·7	189·5	238·2
machinery (all types)	115·9	106·7	119·2	150·9	191·8	258·5	320·8	370·1	412·1	503·2
general index	112·2	113·4	117·3	129·1	138·6	151·0	152·5	157·2	175·0	194·3

(a) Figures relate to agriculture year ending June.

(b) Provisional.

large and medium industries including mineral development	918	756	1126	993	1679	5472	5287	19391	24149	23109	18053	89989	95461
village and small industries . . .	144	183	710	1158	2016	4211	2865	3337	3785	3776	3803	17566	21777
IV. industry and mining .	1062	939	1836	2151	3695	9683	8152	22728	27934	26885	21856	107555	117238
railways	4086	3018	3421	6621	8854	26000	13332	20522	19930	14075	18152	86011	112011
roads	1543	1996	2562	2882	4092	13075	4224	4164	4230	4737	5009	22364	35439
road transport . . .	114	264	264	344	228	1214	349	393	267	377	432	1818	3032
ports and harbours . .	120	143	548	859	1010	2680	830	645	642	522	706	3339	6019
post and telegraph . .	553	617	821	968	925	3884	952	951	1002	1020	1134	5059	8943
shipping	194	107	343	616	566	1826	897	882	1072	1161	1256	5268	7094
civil aviation and others .	242	223	560	1034	786	2845	986	1006	1171	1475	1010	5648	8493
broadcasting	23	11	49	52	122	257	123	109	75	47	114	468	725
V. transport and communications	6875	6379	8568	13376	16583	51781	21693	28672	28389	23414	27807	129975	181756
education	1984	2243	2659	3651	4365	14902	2338	3494	5200	6734	7810	25576	40478
health	1172	1325	1650	2287	3351	9785	2611	3358	4044	5574	6047	21634	31419
housing	284	337	476	719	1532	3348	1182	1047	1709	1929	2166	8033	11381
welfare of backward classes	325	389	628	810	1032	3184	809	1152	1389	2372	2219	7941	11125
social welfare, labour and labour welfare . . .	74	77	73	77	101	402	149	382	802	811	1355	3499	3901
rehabilitation	2618	2026	1347	1569	2010	9570	1704	1236	1220	1131	1050	6341	15911
VI. social services . .	6457	6397	6833	9113	12391	41191	8793	10669	14364	18551	20647	73024	114215
VII. miscellaneous . .	296	261	1315	2232	1964	6068	1492	1672	2070	2057	2689	9980	16048
grand total . .	25960	26753	34304	47592	61391	196000	63283	88419	100144	101051	107103	460000	656000

*Estimated.

(a) Outlay 'under multipurpose projects' has been distributed between 'irrigation' and power'.

APPENDIX B

Statement B-I : Outlays in First and Second Plans—year-wise

(Rs. lakhs)

head of development	1951-52	1952-53	1953-54	1954-55	1955-56	Total 1951-56	1956-57	1957-58	1958-59	1959-60*	1960-61*	Total 1956-61	Total 1951-61
1	2	3	4	5	6	7	8	9	10	11	12	13	14
agricultural production including minor irrigation	2343	2223	3004	4312	5730	17612	2597	3061	4037	4726	4783	19204	36816
animal husbandry including dairying and milk supply	246	267	252	328	460	1553	314	507	670	841	1015	3347	4900
fisheries	44	36	39	54	98	271	72	111	156	255	312	906	1177
forests and soil conservation	96	115	147	239	553	1150	413	550	739	995	992	3689	4839
I. agricultural programmes	2729	2641	3442	4933	6841	20586	3396	4229	5602	6817	7102	27146	47732
cooperation including warehousing, marketing and storage	77	71	92	98	162	500	319	645	633	939	1345	3881	4381
community development including panchayats and local development works	127	286	1066	2548	3876	7903	3186	3708	4681	4731	5567	21873	29776
II. community development and cooperation	204	357	1158	2646	4038	8403	3505	4353	5314	5670	6912	25754	34157
multipurpose projects	3535	4138	5117	5587	5284	23661	(a)	(a)	(a)	(a)	(a)	(a)	(a)
irrigation including flood control	2569	3146	3184	4586	6259	19744	8233	8175	8083	8243	9283	42017	85422
power	2233	2495	2851	2968	4336	14883	8019	7921	8388	9414	10807	44549	59432
III. irrigation and power	8337	9779	11152	13141	15879	58288	16252	16096	16471	17657	20090	86566	144854

roads	522	800	717	850	1333	1900	1838	1650	518	900
road transport	32	350	68	25	30	200	355	300	102	63
ports and harbours	..	..		..	..	..	196	200	..	25
other transport	..	..	3	130	..	30	..	..	..	50
tourism	7	6	10	10	1	10	..	30	6	50
V. transport and communications	561	1156	798	1015	1364	2140	2389	2180	626	1088
general education and cultural programmes	968	2066	675	1369	1697	3403	1078	1415	1119	1469
technical education	214	295	168	305	194	504	(d)	307	(d)	378
health	1027	1900	414	865	1294	2150	832	1644	501	1350
housing	457	610	113	275	391	575	608	885	135	430
welfare of backward classes	461	537	824	1030	434	728	295	305	260	195
social welfare	43	83	29	20	32	35	(e)	41	10	39
labour and labour welfare	65	135	36	100	106	280	(e)	146	19	80
public cooperation	..	(f)	..	(f)		(f)		5		5
VI. social services	3235	5626	2259	3964	4148	7675	2813	4748	2044	3946
statistics	15	5	17	22	36	18		11		15
information and publicity	25	20	22	34	38	50		25		13
local bodies	47	..	20	25	..	..		35		..
State capital projects	180	..	..	..	..	..		..		..
others	..	25	76	50	..	50		..		5
VII. miscellaneous	267	50	135	131	74	118	109	71	185	33
grand total	18064	30500	6315	12000	17687	33704	14683	23500	7900	17000

(a) Provision included under 'cooperation'.
(b) Provision included under 'community development'.
(c) Provision included under 'village and small industries'.
(d) Provision included under 'general education and cultural programmes'.
(e) Provision included under 'welfare of backward classes'.
(f) In the following States, outlays for public cooperation will have to be found within the agreed Third Plan ceiling by suitable adjustments— Andhra Pradesh and Bihar—Rs. 6 lakhs each; Assam—Rs. 1 lakh.

Statement B-II: Estimated expenditure in Second Plan and outlays in Third Plan—States

(Rs. lakhs)

head of development	Andhra Pradesh		Assam		Bihar		Gujarat		Kerala	
	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay
1	2	3	4	5	6	7	8	9	10	11
agricultural production	546	1246	235	507	1343	1936	424	798	464	1400
minor irrigation	710	1826	191	390	827	839	880	1500	170	572
soil conservation	77	163	10	50	161	250	149	827	22	120
animal husbandry	206	385	68	117	366	468	55	250	69	150
dairying and milk supply	54	296	6	23	41	212	117	185	18	60
forests	105	145	110	90	176	295	98	224	65	375
fisheries	61	115	32	50	31	89	64	123	72	450
warehousing, marketing and storage	30	72	59	35	17	50	89	93	(a)	44
I. agricultural programmes	1789	4248	711	1262	2962	4139	1876	4000	880	3171
cooperation	300	575	114	200	280	518	357	457	56	246
community development	1575	2550	526	835	2147	3500	1563	1367	456	805
panchayats	22	300	150	140	97	92	(b)	114	..	72
II. community development and cooperation	1897	3425	790	1175	2524	4110	1920	1938	512	1123
irrigation	5816	7380	97	228	2582	6157	3536	5124	834	1142
flood control	..	243	529	500	..	900	..	50	67	421
power	3469	6494	530	2750	3125	7062	1555	4648	2204	4356
III. irrigation and power	9285	14117	1156	3478	5707	14119	5091	9822	3105	5919
large and medium industries	167	600	160	535	213	280	(c)	318	118	920
mineral development	..	11	..	..	11	20	(c)	50	..	..
village and small industries	863	1267	306	440	684	1103	485	373	430	800
IV. industry and mining	1030	1878	466	975	908	1403	485	741	548	1720

village and small industries	498	810	362	829	1272	2016	512	775	353	510
IV. industry and mining	498	1590	393	1050	1386	2351	799	1572	413	698
roads	1582	3051	892	1700	533	1100	924	900	557	800
road transport	223	630	2	70	..	..	430	200	25	46
ports and harbours	96	50	..	..	..	..	5	215	..	..
other transport	..	30	..	..	..	..	..	..	..	..
tourism	..	34	..	10	5	25	11	15	2	5
V. transport and communications	1901	3795	894	1780	538	1125	1370	1330	584	851
general education and culturale programmes	1525	2394	1230	2712	1141	2564	978	1620	579	1514
technical education	(d)	715	229	483	232	652	203	436	91	215
health	1548	2722	971	2130	1435	2150	1147	1700	352	914
housing	1809	1678	288	550	480	700	325	500	108	200
welfare of backward classes	603	778	269	800	459	326	279	440	341	463
social welfare	(c)	114	36	70	18	52	35	30	10	16
labour and labour welfare	(c)	302	51	120	48	133	40	102	47	76
public cooperation		..	..	(f)	..	(f)	..	(f)		4
VI. social services	5485	8703	3074	6865	3813	6577	3007	4828	1528	3402
statistics	(g)	29	21	28	9	24	5	18	18	27
information and publicity	144	37	20	39	16	35	6	35	26	34
local bodies	..	..	61	75	76	..	34	..	18	25
State capital projects	..	..	365	700	..	..	..	..	215	275
others	12	..	4	38	..	..	..	..	20	25
VII. miscellaneous	156	66	471	880	101	59	45	53	297	386
grand total	21403	39000	14550	30000	18619	29088	13872	25000	8936	16000

(a) Provision included under 'cooperation'.
(b) Provision included under 'community development'.
(c) Provision included under 'village and small industries'.
(d) Provision included under 'general education and cultural programmes'.
(e) Provision included under 'welfare of backward classes'.
(f) In the following States, outlays for public cooperation will have to be found within the agreed Third Plan ceiling by suitable adjustments:—
Madhya Pradesh and Madras—Rs. 6 lakhs each; Mysore Rs. 5 lakhs.
(g) Included under 'information and publicity'.

Statement B-II : Estimated expenditure in Second Plan and outlays in Third Plan—States

(Rs. lakhs)

Head of development	Maharashtra		Madhya Pradesh		Madras		Mysore		Orissa	
	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay
	12	13	14	15	16	17	18	19	20	21
agricultural production	832	1489	729	1400	450	1067	434	1304	269	682
minor irrigation	998	1579	849	1500	632	1280	1027	1600	165	304
soil conservation	604	2084	95	300	134	250	152	300	50	84
animal husbandry	137	166	172	400	197	352	75	195	151	228
dairying and milk supply	238	512	31	120	117	275	22	175	8	44
forests	124	295	196	600	71	212	106	289	48	160
fisheries	154	249	20	75	79	222	44	130	80	190
warehousing, marketing and storage	(a)	130	..	40	(a)	40	32	112	18	30
I. agricultural programmes	3087	6504	2092	4435	1680	3698	1892	4105	789	1722
cooperation	680	957	282	670	180	471	240	475	104	237
community development	2432	2400	1700	2250	1343	2036	999	1535	995	1750
panchayats	(b)	227	56	290	..	10	32	69	49	101
II. community development and cooperation	3112	3584	2038	3210	1523	2517	1271	2079	1148	2088
irrigation	3097	6604	2852	4160	1693	2742	2800	4066	2805	2141
flood control	..	30	..	20	..	..	..	..	..	250
power	4067	8124	2736	7600	7885	10019	2688	6967	1372	4462
III. irrigation and power	7164	14758	5588	11780	9578	12761	5488	11033	4177	6853
large and medium industries	(c)	695	25	191	114	310	132	689	35	35
mineral development	(c)	85	6	30	..	25	155	108	25	153

large and medium industries	55	322	15	30	324	368	2310	1204	115	353	3783	6850
mineral development	..	10	9	365	6	6	..	92	..	153	212	1108
village and small Industries	412	1108	296	500	919	1775	592	997	114	400	8098	13703
IV. industry and mining	467	1440	320	895	1249	2149	2902	2293	229	906	12093	21661
roads	1003	1200	1011	1300	1501	3048	1468	1800	496	832	14895	21831
road transport	26	60	..	..	66	..	198	100	..	..	1557	2044
ports and harbours	..	..	..	..	..	..	..	..	..	..	297	490
other transport	..	..	..	..	..	..	10	33	..	..	13	273
tourism	6	23	12	20	19	38	4	17	56	100	139	393
V. transport and communications	1035	1283	1023	1320	1586	3086	1680	1950	552	932	16901	25031
general education and cultural programmes	827	1796	1129	1778	1429	5041	2658	2367	213	398	17246	31906
technical education	190	709	68	332	326	937	313	618	24	100	2252	6986
health	619	1310	698	1595	1177	4126	1427	1980	256	578	13698	27114
housing	450	305	219	420	849	920	583	1372	110	200	6925	9620
welfare of backward classes	261	336	171	325	542	961	144	250	29	24	5372	7498
social welfare	29	74	15	40	30	80	47	340	3	14	337	1048
labour and labour welfare	48	155	42	100	162	414	90	346	6	30	760	2519
public cooperation		5	..	5		6		(a)		4	..	34
VI. social services.	2424	4690	2342	4595	4515	12485	5262	7273	641	1348	46590	86725
statistics	9	19	8	30	25	46	1	22	3	8		322
information and publicity	29	50	35	65	53	72	21	40	12	13		562
local bodies	..	..	..	75	..	..	67	..	71	75		310
State capital projects	676	500	34	..	..	..	..	1000	..	..		2475
others	65	46	25	40	121	336	8	53	60	407		1075
VII miscellaneous	779	615	102	210	199	454	97	1115	146	503	3163	4744
grand total	15143	23139	9986	23600	22832	49700	15584	25000(b)	2682	7500	208256	384731

(a) Outlays of Rs. 6 lakhs for public cooperation will have to be found within the agreed Third Plan ceiling by suitable adjustments.

(b) The distribution of outlays in West Bengal is subject to adjustments on account of (a) West Bengal's share in the D.V.C. and (b) increase n resources, estimated at Rs. 43 crores which the State Govt. expect to raise above the level of Rs. 90 crores shown in Chapter VI— Financial Resources.

Statement B-II: Estimated expenditure in Second Plan and outlays in Third Plan—States

(Rs. lakhs)

head of development	Punjab		Rajasthan		Uttar Pradesh		West Bengal		Jammu & Kashmir		Total States	
	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay
	22	23	24	25	26	27	28	29	30	31	32	33
agricultural production	604	1133	320	659	1814	2746	430	1634	46	350	8940	18351
minor irrigation	487	752	394	670	1634	3300	204	1032	99	125	9267	17269
soil conservation	53	189	40	140	127	409	53	466	38	100	1765	5732
animal husbandry	121	268	120	471	225	666	99	411 }	47	65	2108	4592
dairying and milk supply	69	180	9	69	32	300	354	600 }		35	1116	3086
forests	117	278	131	245	231	662	121	234	42	100	1741	4204
fisheries	8	45	6	20	33	102	36	205	6	25	726	2090
warehousing marketing and storage	14	31	10	26	12	97	19	43	..	..	300	843
I. agricultural programmes	1473	2876	1030	2300	4108	8282	1316	4625	278	800	25963	56167
cooperation	171	424	176	400	405	1084	113	165	28	80	3486	6959
community development	839	1230	1095	1200	2644	5167	928	1239	345	325	19587	28189
panchayats	60	112	55	580	..	411	59	197	..	109	580	2824
II. community development and cooperation	1070	1766	1326	2180	3049	6662	1100	1601	373	514	23653	37972
irrigation	3952	2204	2268	8510	2435	5171	2033	1892	93	600	36893	58121
flood control	35	1501	..	90	..	575	..	515	..	900	631	5995
power	3908	6764	1575	3500	5691	10836	1194	3736	370	997	42369	88315
III. irrigation and power	7895	10469	3843	12100	8126	16582	3227	6143	463	2497	79893	152431

large and medium industries	..	..	1	29	..	..	..	..	..	..
mineral development	..	..	..	..	..	..	..	..	..	..
village and small industries	165(b)	165	39	82	2	6	25	30	9	49(b)
IV. industry and mining	165	165	40	111	2	6	25	30	9	49
roads	26	220	622	800	..	..	40	60	186	397
road transport	..	320	58	140	..	..	..	..	32	39
ports and harbours	..	..	..	..	8	18	37	..	..	..
other transport	..	..	..	..	..	..	..	..	..	..
tourism	..	..	2	12	..	..	..	2	..	5
V. transport and communications	26	540	682	952	8	18	77	62	218	441
general education and cultural programmes	402	1144	72	205	12	19	26	142	65	110
technical education	..	114	4	18	..	..	6	25	..	..
health	115	1509	150	213	10	10	48	160	40	172
housing	181	1905	33	60	..	2	14	21	13	24
welfare of backward classes	15	23	40	82	..	5	5	10	87	128
social welfare	..	74	4	17	..	..	2	8	2	4
labour and labour welfare	2	141	..	37	..	..	1	5	..	..
public cooperation										
VI. social services	715	4910	303	632	22	36	102	371	207	438
statistics	1	3	2	7	..	..	1	4	1	2
information and publicity	2	3	11	25	..	1	1	5	3	5
local bodies	..	..	7	10	..	..	7	20	2	25
State capital projects	..	..	..	..	..	..	..	..	..	..
others	..	520	..	..	..	..	..	1	31	..
VII miscellaneous	3	526	20	42	..	1	9	30	37	32
grand total	1142	8175	1697	2793	42	97	366	693	622	1288

(a) Provision included under 'soil conservation'.
(b) Includes provision for 'metric system'.

Statement B-III : Estimated expenditure in Second Plan and outlays in Third Plan—Union Territories

(Rs. lakhs)

head of development	Delhi		Himachal Pradesh		Laccadive Islands		Pondicherry		Manipur	
	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay
1	2	3	4	5	6	7	8	9	10	11
agricultural production	9	23	82	199	2	2	13	39	11	29
minor irrigation	12	30	68	75	..	..	5	12	5	13
soil conservation	7	8	..	198	..	..	..	12	..	1
animal husbandry }	14	18	37	64	..	3	7	14	6	15
dairying and milk supply }		5	..	6	..	..	..	..	..	..
forests	(a)	6	56	80		..		..	4	25
fisheries	1	10	5	13	7	18	7	9	2	7
ware-housing, marketing and storage	..	5	10	4	..	..	1	..	..	..
I. agricultural programmes	43	105	258	639	9	23	33	86	28	9
cooperation	15	18	9	38	..	8	7	12	9	18
community development	27	11	195	160	..	..	34	18	70	98
panchayats	3	..	27	22	..	..	..	..	..	3
II. community development and cooperation	45	29	231	220	..	8	41	30	79	119
irrigation	..	..	..	..	..	..	21	10	..	..
flood control	11	110	..	..	..	..	..	5	..	12
power	134	1790	163	197	1	5	58	69	44	107
III. irrigation and power	145	1900	163	197	1	5	79	84	44	119

large and medium industries	1	2	..	1	..	..	..	..	2	32
mineral development	..	..	..	..	..	..	..	..	..	..
village and small industries	43	64	3	13	6	11	1	5	293	425
IV industry and mining	44	66	3	14	6	11	1	5	295	457
roads	380	430	70	238	142	180	184	250	1650	2575
road transport	..	50	1	10	..	..	..	..	91	559
ports and harbours	..	..	..	..	..	..	..	..	45	18
other transport	..	..	99	263	..	25	..	..	99	288
tourism	..	..	..	3	10	..	..	..	12	22
V transport and communications	380	480	170	514	152	205	184	250	1897	3462
general education and cultural programmes	103	240	13	57	45	82	47	105	785	2104
technical education	22	16	..	..	..	..	(a)	..	32	173
health	94	168	12	51	68	133	63	150	600	2566
housing	10	45	24	16	..	..	1	3	276	2076
welfare of backward classes	76	135	..	6	..	..	..	..	223	389
social welfare	1	11	..	..	..	..	1	..	10	114
labour and labour welfare	1	1	..	3	..	..	..	2	4	189
public cooperation										
VI social services	307	616	49	133	113	215	112	260	1930	7611
statistics	..	7	..	1	1	3	..	..	6	27
information and publicity	3	9	..	3	2	4	1	3	23	58
local bodies	32	..	..	10	..	..	..	..	48	65
State capital projects	..	..	..	..	..	..	..	..	..	....
others	..	2	..	4	..	6	..	..	31	533
VII miscellaneous	35	18	..	18	3	13	1	3	108	683
grand total	941	1632	362	979	374	715	378	715	5924	1708

N.B. The anticipated expenditure in Second Plan is that reported by the States in reply to Planning Commission letter dated 7-2-1961.

(a) Provision included under 'general leducation and cultural programmes'.

Statement B-III : Estimated expenditure in Second Plan and outlays in Third Plan—Union Territories

head of development	Tripura		Andamans		NEFA		NHTA (Nagaland)		Total Union Territories	
	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay	Second Plan estimated expenditure	Third Plan outlay
	12	13	14	15	16	17	18	19	20	21
agricultural production	28	67	107	164	23	33	13	42	288	598
minor irrigation	6	35	..	..	1	5		7	97	177
soil conservation	1	17	..	10	..	..	..	..	8	246
animal husbandry	8	24	3	4	3	20	4	10	82	172
dairying and milk supply	3	9	..	4	..	..		..	3	24
forests	14	44	14	57	29	43	5	12	122	268
fisheries	4	22	2	15	..	5	1	4	29	102
ware-housing, marketing and storage	..	1	..	..	..	..	..	..	11	10
I. agricultural programmes	64	219	126	254	56	106	23	75	640	1597
cooperation	16	32	1	4	6	12	..	9	63	151
community development	61	90	12	25	29	93	36	83	464	578
panchayats	..	28	..	3	..	..	..	..	30	56
II. community development and cooperation	77	150	13	32	35	105	36	92	557	785
irrigation	..	..	..	..	..	..	..	..	21	10
flood control	..	10	..	..	..	..	..	..	11	137
power	34	73	1	14	9	60	21	30	465	2345
III. irrigation and power	34	83	1	14	9	60	21	30	497	2492

Table 2: Estimates of population growth for 1966, 1971 and 1976

(in millions)

age group	1961			1966			1971			1976		
	total	male	female	total	male	female	total	male	female	total	male	female
1	2	3	4	5	6	7	8	9	10	11	12	13
0—4	71·3	36·6	34·7	79·8	40·8	39·0	89·9	45·9	44·0	97·7	49·8	47·9
5—9	58·6	30·3	28·3	66·6	34·3	32·3	75·5	38·7	36·8	85·7	43·9	41·8
10—14	46·1	23·6	22·5	56·9	29·4	27·5	65·0	33·5	31·5	73·8	37·8	36·0
0—14	176·0	90·5	85·5	203·3	104·5	98·8	230·4	118·1	112·3	257·2	131·5	125·7
15—19	40·1	20·6	19·5	45·0	23·0	22·0	55·8	28·8	27·0	63·8	32·8	31·0
20—24	37·0	19·1	17·9	39·2	20·0	19·2	44·1	22·4	21·7	54·8	28·2	26·6
25—29	33·8	17·2	16·6	36·1	18·5	17·6	38·2	19·5	18·7	43·2	21·9	21·3
30—34	30·1	15·3	14·8	32·6	16·6	16·0	34·6	18·0	16·6	37·3	19·1	18·2
35—39	26·5	13·7	12·8	28·8	14·7	14·1	31·4	16·0	15·4	33·6	17·5	16·1
40—44	23·0	12·2	10·8	25·3	13·1	12·2	27·7	14·2	13·5	30·4	15·5	14·9
45—49	19·4	10·4	9·0	21·7	11·5	10·2	24·0	12·4	11·6	26·4	13·5	12·9
50—54	15·9	8·5	7·4	18·0	9·6	8·4	20·2	10·7	9·5	22·6	11·7	10·9
55—59	12·7	6·7	6·0	14·3	7·6	6·7	16·4	8·7	7·7	18·5	9·7	8·8
60—64	9·5	4·9	4·6	10·9	5·7	5·2	12·5	6·5	6·0	14·4	7·5	6·9
15—64	248·0	128·6	119·4	271·9	140·3	131·6	304·9	157·2	147·7	345·0	177·4	167·6
65—69	6·3	3·2	3·1	7·6	3·8	3·8	9·0	4·6	4·4	10·3	5·3	5·0
70 and over	7·7	3·5	4·2	8·7	4·1	4·6	10·4	4·9	5·5	12·6	6·0	6·6
65 and over	14·0	6·7	7·3	16·3	7·9	8·4	19·4	9·5	9·9	22·9	11·3	11·6
all ages	438·0	225·8	212·2	491·5	252·7	238·8	554·7	284·8	269·9	625·1	320·2	304·9

APPENDIX C

NOTES ON POPULATION AND EMPLOYMENT

I

POPULATION PROJECTIONS FOR THE FOURTH AND FIFTH PLANS

The Report on the Census of 1951 calculated two sets of projections for the growth of population upto 1981 on the basis of two sets of assumptions, namely, that the rate of growth during this period would be the same as that calculated from the Census data (a) for the period 1921–1950, or alternatively, (b) for the period 1941–50. These estimates were accepted as the basis for the projections used in the Report on the Second Five Year Plan and are reproduced in column 2 of Table 1.

2. Following the 1951 Census, demographic data began to be collected by the National Sample Survey; these data consistently indicated a much higher rate of growth of population. For use in the Draft Outline of the Third Plan, fresh estimates were, therefore, prepared in 1959 by the Central Statistical Organisation (C.S.O.) assisted by the Registrar-General; these estimates are given in column 3 of Table 1:

Table 1: Population projections, 1961–1976.

(in millions)

year	Second Five Year Plan	1959 C.S.O.	1961 Study Group
1	2	3	4
1961 .	408	431	438*
1966 .	434	480	492
1971 .	465	528	555
1976 .	499	578	625

3. The 1961 Census gave a provisional total population of 438 millions; this was about 2 per cent higher than the figure adopted in the Outline of the Third Plan; and was 30 millions (7 per cent) higher than the projection given in the Second Five Year Plan. A study group assisted by the Registrar-General and the C.S.O. prepared revised estimates based on the following assumptions: general fertility rate of 189 per thousand to continue upto 1971 and then declining by 10 per cent by 1976; and expectation of life at birth of 47·5 years in 1961, increasing by 0·75 years annually upto 1966 and by 0·50 years upto 1976. These projections are given in column 4 of Table 1. More detailed estimates, by age-groups, separately for the two sexes, were prepared by the same study group; these are given in Table 2.

*Provisional total of 1961 Census.

II

ESTIMATES OF ADDITIONAL EMPLOYMENT IN THE THIRD PLAN

In Chapter X—Employment and Manpower—a general account has been given of the approach adopted in estimating the likely additional employment during the Third Plan on account of the development programmes and projects included in the Plan. There is continuous need for gathering additional data, checking assumptions and improving methods of estimation. To facilitate further study and improvement of the present estimates, this note sets out briefly the main assumptions adopted in calculating the additional employment potential for the Third Plan apart from special schemes like the rural works programmes and others which may be undertaken.

2. It is reckoned that, as at present formulated, the Third Plan could yield about 14 million additional jobs, about 10·5 million being outside agriculture and about 3·5 million in agriculture. The additional employment outside agriculture is distributed as follows:

Additional non-agricultural employment

	sector	(in lakhs)
1	construction	23·00*
2	irrigation and power	1·00
3	railways	1·40
4	other transport and communications	8·80
5	industries and minerals	7·50
6	small industries	9·00
7	forestry, fisheries and allied services	7·20
8	education	5·90
9	health	1·40
10	other social services	0·80
11	government service	1·50
	total	67·50
12	Others including trade and commerce at 56 per cent of the total of items 1—11	37·80
	grand total	105·30

*Further break-up of construction employment :

		(in lakhs)
1	agriculture and community development	6·10
2	irrigation and power	4·92
3	industries and minerals, including cottage and small industries	4·60
4	transport and communications including railways	3·47
5	social services	3·40
6	miscellaneous	0·50
	total	23·00

4. Changes in birth and death rates are known to be of a most complex nature. In India stress is being laid on family planning, but it is still uncertain how effective such efforts would become over the next five or ten years. Population projections given in Table 2 are, therefore, based on assmuptions which are necessarily somewhat speculative in character. The actual growth of population may deviate from the above assumptions; and yet a standard set of population figures is indispensable for the calculation of various Plan targets for future years. The projections given here are being adopted provisionally for present purposes. It is fully appreciated that the only way of improving the estimates would be collection of demographic data of adequate reliability in the inter-census period.

'Selected Projects during the Second Five Year Plan' (March, 1961) shows that in the projects included in this analysis, a rough employment-investment ratio will be of the order of 7000 man-years per crore. On this basis, the expected man-years of additional employment of the construction component of the irrigation projects would be of the order of nearly 2·63 lakh man-years. It may be pointed out, however, that since the projects represented in the Progress Report are among the larger projects, the employment estimates thus arrived at may understate the employment potential of the investment on irrigation.

Power.—The step-up of expenditure in power projects between the last year of the Second Plan and the last year of the Third Plan is estimated at Rs. 140 crores. Experience in the Second Plan shows that an investment of a crore of rupees in power projects will yield in the construction phase an employment of 1600 man-years. On this basis, the additional construction employment generated on power projects and the power component of multi-purpose projects will be 2·24 lakh man-years.

Irrigation and power projects would, thus, account for a total of 4·87 (or, say, 4·90) lakh man-years of additional employment.

(ii) *Transport.*—Construction activity under transport is broadly divided into railways, roads, ports and harbours and other transport and communications. For the railways it is estimated that increase in annual expenditure over the Third Plan period will be in the neighbourhood of Rs. 53·5 crores. For a crore of total expenditure on railways, employment in construction will be of the order of 1900 man-years. On this basis, railways will account for additional construction employment in the Plan period of about 1 lakh man-years. Similar calculations for roads, where the employment norm has been worked out on the basis of the Report of the Chief Engineers on Roads for India (1961—81) show that for the expected step-up of expenditure in the last year of the Plan, the additional employment in man-years will be nearly 2.14 lakhs. Calculations for ports and harbours and other transport and communications show an increase in construction employment of the order of 31,000. The total under this head comes to 3·45 lakhs (shown as 3·4 lakhs in the Table in paragraph 2).

In regard to other sectors of construction employment, similar methods of calculation have been used.

CONTINUING EMPLOYMENT

6. Estimates of direct employment during the continuing phase present even greater difficulty than those for the construction phase. Information based on a close study of experience within different branches of economic life is limited. Estimates of continuing employment outside agriculture can be related either to the amount of capital at given prices required per person maintained in continuous employment or to output per person after making a suitable allowance for increase in productivity.

3. In estimating additional employment there are three preliminary assumptions. Firstly, in relation to the existing capacity, production and employment will not be allowed to fall below the present levels. In particular, difficulties which employers may experience in working to their present capacity will be removed and employment in existing units will at-least be maintained. Secondly, the various development programmes for which the Plan provides will be undertaken with the necessary efficiency and economy and continuity in output would be assured. Thirdly, in all construction activities, subject to overall considerations, preference will be given to labour-intensive methods.

4. In relation to development in the Third Plan additional employment has to be estimated:

(a) in non-agricultural sectors in respect of—

(i) the construction phase,

(ii) the continuing phase, that is as a result of the operation and maintenance of assets created during the process of construction, and

(iii) indirect employment outside agriculture, mainly in trade, commerce and miscellaneous services, including transport outside the organised sector, and

(b) in agriculture.

EMPLOYMENT IN CONSTRUCTION

5. Construction is an important element in all fields of development. Estimates of additional employment under this head refer to employment during construction over the entire range of projects under the Plan, such as irrigation and power, roads, railways, factory buildings, housing, buildings for schools and hospitals etc. In the main, employment during the construction phase is estimated with reference to the increase in outlay in 1965-66 above the level of 1960-61, which serves as the base year. Data concerning outlays and their phasing are derived from information received from Central Ministries and State Governments and from special studies or such other information as can be pieced together. For each class of works an attempt is made to calculate the number of persons likely to be employed for about 300 days in a year for a crore of developmental outlay. By way of illustration, employment calculations in two important construction sectors, namely, (i) irrigation and power and (ii) transport, have been detailed below:

(i) *Irrigation.*—The difference between the anticipated outlay in 1965-66 and 1960-61 is reckoned to be of the order of Rs. 37·5 crores. Experience of the Second Five Year Plan, as analysed in the 'Progress of

(iii) *Mining.*—As an illustration of employment calculations using only physical targets, the manner in which additional employment in mining has been worked out may be given. Of the employment of 7·5 lakhs shown against 'industries and minerals' in the Table in paragraph 2, the latter will account for about a third of the total, that is, about 2·5 lakhs. Details of calculations are shown as in the Table below:

production	million tons	productivity per person (in tons per year)	number of persons employed (in lakhs)
(a) *coal*: 1960-61	54·6	140	3·9
1965-66	97·0	180	5·4
additional employment			1·5
(b) *iron ore*: 1960-61	10·7	170	0·6
1965-66	30·0	225	1·3
additional employment			0·7
total coal and iron ore			2·2

As for other minerals, experience over the period 1951—58 has shown that the rate of increase in employment has been of the order of 7000 persons per year. On the same basis, the additional employment in the Third Five Year Plan is expected to be of the order of 35,000. The total additional employment, therefore, is estimated at 2.55 lakhs of which, as mentioned earlier, account has been taken for only 2·5 in the estimates presented earlier.

7. Under large and medium industries there will be different norms of continuing employment. The following Table, which is essentially illustrative, indicates the amount of capital required per person in a number of important industries:

name of industry	capital required per person Rs.
steel	160000
fertilisers	40000
machine tools (graded)	25000
heavy machine building plant	100000
foundry/forge plant	100000
coal mining machinery	60000
heavy electricals	50000

8. It should, however, be stated that the data on which the calculations given above are based, are on the whole very meagre. The conclusions which are drawn are, therefore, intended only to suggest broad dimensions. Indeed, precision in this field can only come from prolonged study.

Employment calculations in three important sectors namely, (i) village and small industries, (ii) education and (iii) mining, have been given below to illustrate the method.

(i) *Village and small industries.*—Working Groups set up by the Small Scale Industries Board have worked out estimates of investment employment ratios for different activities on which expenditure is likely to be incurred during the Third Plan. For small-scale industries employment of one person would mean an investment on the average of Rs. 5000; for handicrafts the estimate is Rs. 1500, for coir and sericulture it is roughly Rs. 1000. On the basis of the Third Plan allocations to these different activities under village and small industries, a rough employment estimate of 3·57 lakhs against outlays in the public sector has been worked out. Similar outlays estimated in the private sector are expected to yield an employment of nearly 5 lakhs, bringing the total to 8·57 or nearly 9 lakhs. This excludes outlays on handlooms, powerlooms, khadi and village industries of the order of Rs. 130 crores in the public sector, which will mainly yield relief to under-employed persons.

(ii) *Education.*—As mentioned earlier, calculations of continuing employment in the education sector have been based on teacher-pupil ratio. Details of calculations have been shown in the Table below. An adjustment of about 30,000 has been made in these figures in order to account for the practical difficulties envisaged in securing adequate number of teachers. Total employment under education is, therefore, shown at 5·9 lakhs.

Additional Employment due to Education Schemes

(Figures in lakhs)

	on roll	pupils per teacher	number of teachers
(a) 6—11 age—group			
1960-61	343·4	1:37	9·28
1965-66	496·4	1:38	13·06
		additional	3·78
(b) 11—14 age—group			
1960-61	62.9	1:28	2·25
1965-66	97·5	1:28	3·48
		additional	1·23
(c) 14—17 age—group			
1960-61	29.1	1:14	2·08
1965-66	45·6	1:16	2·85
		additional	0·77
(d) University education			0·40
		total	6·18
		less	0·30
			5·88
		or when rounded	5.90 lakhs

GLOSSARY

Abadi (village) . . .	Residential area of the village
Ashram Schools . .	Residential type of vocational and agricultural schools
Ayurveda	An indigenous system of medicine
Ayurvedacharya . . .	A degree in Ayurveda
Bal Bhavan . . .	Recreation centre for children
Bal Sevika	A woman worker trained for child welfare
Balroga	Diseases of children
Balwadis	Pre-primary or nursery schools
Barani	Unirrigated land
Bargadar	Term used in West Bengal for share-croppers
Benami transfer . . .	Fictitious transfer of land or other property
Bharat Sadhu Samaj . .	An All-India organisation of Sadhus for social work and moral uplift
Bharat Sevak Samaj . .	An All-India voluntary organisation engaged in constructive work for national development
Bharatiya Adimjati Sangh .	An All-India organisation for the welfare of tribal people (Adivasis)
Bharatiya Grameen Mahila Sangh	An All-India organisation serving women in rural areas
Bhoodan	Donation of land for the landless—a movement initiated by Acharya Vinoba Bhave
Bidri	A well known handicraft of Andhra Pradesh
Buddha Jayanti . . .	Birth anniversary of the Lord Buddha
Chalka	A type of poor quality land in parts of Andhra Pradesh
Charkha	Hand-operated one-spindle spinning wheel
Charkha—Ambar . .	Hand-operated multi-spindle spinning unit
Charmalaya . . .	A centre for flaying and curing of hides and economic utilisation of carcasses

9. Apart from employment which can be attributed to different items in the first 11 sectors of the Table in paragraph 2, there will be other activities in the economy in which increases in employment will take place. For instance, corresponding to occupations like mining, industries, railways, transport, construction, health, education, public administration, communications, etc. there will be activities connected with trade, banking, insurance, transport (transport other than railways or organised road transport), storage, warehousing, and professions and miscellaneous personal services which cannot be included in employment calculations because of the very nature of such employment. Some of these are areas of self-employment, and self-employment accounts for the occupation of a major portion of the working force. Considerable uncertainty would, therefore, attach to such estimates because in the self-employed sector the distribution of additional work as between those who are at present engaged in it and consider themselves to be under-employed and others who seek new entry is difficult to make with our present knowledge of the mechanism of employment generation in these fields. However, from such studies as have been undertaken, it appears that at present additional employment of this type might be of the order of 56 per cent of the increase in employment resulting from the first 11 categories of Table in paragraph 2. As has been mentioned in the Chapter on Employment and Manpower this estimate is based on the analysis of the 1951 Census data. When the results of the latest census become available, it will be possible to arrive at a closer approximation of such employment effects.

EMPLOYMENT IN AGRICULTURE

10. In agriculture, it is extremely difficult to distinguish between net additional employment and expansion in employment providing relief for under-employment. From such limited enquiries as have been undertaken, it would appear that there might be net additional employment in agriculture to the extent of about 30 per cent of the area benefited by irrigation, soil conservation and flood control. In schemes for land reclamation and for settlement of landless workers, the resulting employment would represent more or less a net addition. If a norm of 4 acres per person employed is assumed, the resulting additional employment works out as follows: about 1·5 million from irrigation, 1·2 million from soil conservation and land reclamation, 300,000 from flood control, drainage and anti-water logging schemes, and about 500,000 from settlement of landless workers on land, making a total of about 3·5 million.

Gurukul	Residential educational institution imparting religious and general education
Harijan Sevak Sangh . .	An All-India organisation for the welfare of scheduled castes founded by Mahatma Gandhi
Inam	Estate or grant recognised by Government and enjoying complete or partial exemption from payment of land revenue
Jagir	An assignment of land revenue or other rights in an estate or village
Jan Jagran	Mass awakening and social enlightenment
Khadi . . .	Hand-spun and hand-woven cloth
Khadi—Ambar . . .	Hand-woven cloth made from yarn spun on Ambar Charkha
Kharif	Agricultural season corresponding to summer months
Kotar	Ravines
Lok Karya Kshetra . .	Voluntary rural welfare project
Lunga	Low-lying land in Tripura
Mahila Mandal . . .	Association of women
Mandi	Market
Nal	Level land in Tripura
Nidana	Diagnosis
Padartha Vijnan . .	Physical science
Panchayat Samiti . .	A statutory representative local body at the block level
Pathashala	School
Panchayati Raj . . .	A system of democratic institutions at the village, block and district levels set up under State legislation
Prasuti Tantra . . .	Obstetrics
Rabi	Agricultural season corresponding to winter months
Rasa Shastra . . .	Chemistry
Stri-Roga	Gynaecology
Sadachar	Right conduct
Sal	Shorea robusta

Charaka, Sushruta, Vagbhatta	Names of leading authorities and writers on Ayurveda
Chikitsa	Therapy
Chir	Pinus longifolia
Dai	Midwife
Darshana	A system of philosophy
Deodar	Cedrus deodara
Diara	Land which is subject to diluvion or alluvion on account of changes in the course of a river
Dravya guna . . .	Materia medica
Gandhi Smarak Nidhi . .	Gandhi National Memorial Fund
Ghani	Bullock-driven oil crusher
Ghani—Wardha . . .	An improved ghani
Gola-grain . . .	A grain store; a system of rural credit based on grain stocks
Gosadan	Home for unproductive and uneconomic cows
Gosamvardhana . . .	Welfare of cattle, specially cows
Goshala	Institute for care and protection of cows
Gram	Village
Gramdan	A movement initiated by Acharya Vinoba Bhave in which the landholders of a village surrender their individual proprietory rights in favour of the village community
Gram Ekai	A compact area comprising a village or group of villages with a population of about 5000 selected for integrated rural development, specially of village industries
Gram Panchayat . . .	Village council
Gram Sabha . . .	Village assembly representing the adult population of the village
Guntha	Area equivalent to 1/40th of an acre
Gur and khandsari . .	Jaggery and fine granulated sugar made in cottage units by open-pan boiling

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A

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C

Sarva Seva Sangh	A federation of voluntary organisations for constructive work founded by Mahatma Gandhi
Shalya (Tantra)	General surgery
Shalakya	Surgery of eye, ear, nose and throat
Sharira vijnan	Anatomy and physiology
Shramdan	Voluntary contribution in the form of labour
Shuddha	Term meaning pure or unmixed, used with reference to Ayurveda
Siddha	A system of indigenous medicine
Swasthya vritta	Hygiene and public health
Taluka	Administrative unit within a district
Taram	Classes of soil grouped for purposes of settlements
Tilla	Elevated land in Tripura
Unani	An indigenous system of medicine
Vaidya	Ayurvedic medical practitioner
Vijnan (Vigyan)	Science
Vriddha Trayi	The three leading classical Ayurvedic works
Vyavahara Ayurveda	Forensic medicine
Zamindari	Intermediary rights in land
Zari	Silver and gold thread work
Zila Parishad	A statutory representative local body at the district level

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